April 16 & 17

PROGRAM

epic EXPO

EARLHAM '19
EPIC Expo and Earlham Day

Earlham’s EPIC Expo is a two-day, campus-wide celebration of scholarship, creativity, and excellence. This event enables the Earlham community to share their academic and creative works via panel sessions, performances, poster presentations, interactive workshops, and other media.

In addition, Earlham Day takes place in collaboration with EPIC Expo, making it a campus and worldwide celebration of Earlham experiences and excellence. Earlhamites will unite to honor and support present and future generations on this 27-hour giving day. Accept the challenge to be one of 1,250 donors; each donation of $1 or more will unlock an additional $200 per donation, up to a combined $250,000. Unite! Give! Inspire!

Your Chance to Win!

Win Earlham prizes! At each session during EPIC Expo, make sure to pick up a ticket, clearly write your name, and drop it in the ticket box. The more sessions you attend, the more chances you have to win! Tickets will be provided at the start of each session and picked up at the end of each session. Prize drawings will take place during the Earlham Day Festival on Wednesday afternoon.
One day to unite. One day to give. One day to inspire. One day to celebrate all things Earlham: the student scholarship presented at EPIC Expo, athletics, off-campus study, the barn, WECI, all those other special Earlham treasures, and YOU!

So much of the Earlham experience is made possible through philanthropy — people who give Earlham their time, talent, and treasure to make it stronger for you and for generations to come.

This Earlham Day that impact goes farther. Thanks to a generous group of alumni donors, every person who gives on Earlham Day will immediately unlock $200 for the Earlham Fund. No matter the size of your gift, you will add $200 to your impact. That’s an extra $200 for student scholarships, faculty support, unique educational experiences and so much more!

Help us discover what the Earlham community can do together.
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Session Types
Interactive Workshops: Participants may come and go as they please and do not need to be present for the entire session. These will be denoted with a “↔” symbol
Panels and Presentations: These sessions consist of multiple presenters discussing one or a variety of topics. There will be time for questions and answers.

For abstracts and additional information, please visit www.earlham.edu/epic-expo.

If you need assistance during the EPIC Expo with program related issues, look for EPIC Expo staff who will have special nametags. You may also contact the Earlham College Box Office in Runyan Center (x1474), contact Maggie Thomas, Faculty Director of EPIC Programs (x1451), or contact Corey Fritz, Assistant Director of EPIC Programs (x1367).
<table>
<thead>
<tr>
<th>Time</th>
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| 9:30 - 10:45 | Poster Presentations  
Covering all areas of the college  
Drury Performance Gym |
| 11:00 - 12:15 | A.1 Neuroscience  
Comp. Sci.  
Chemistry  
CST 103  
A.2 Learning  
Outdoor Ed.  
Env. Ed.  
Richmond Rm.  
A.3 Labor History  
WGSS  
AAAS, PAGS  
LBC 208  
A.4 Replication  
Politics  
Religion  
LBC 211  
A.5 Internship  
Mental Health  
Social Action  
LBC 124  
A.6 Spanish  
Film  
Social Justice  
Carp. 211  
A.7 Cohousing  
Race Relations  
Aging/Japan  
Carp. 212  |
| 12:15 - 1:30 | Lunch  
Regular meal cost for dining hall, standard meal plan for students  
Runyar Center  
Senior Art Sale  
CVPA Atrium |
| 1:30 - 2:45 | B.1 CRISPR  
Genome Edits  
ESEM  
CST 103  
B.2 Environment Policy  
Analysis  
LBC 208  
B.3 Outdoor Ed. Coaching  
Eng. Ed.  
Richmond Rm.  
B.4 Enthography Embodiment  
SOAN  
LBC 211  
B.5 Bonner Leadership  
Off-Campus  
LBC 124  
B.6 Theatre Research  
Steampunk  
Wilkinson  
B.7 Rock Music History  
TEDTalk  
CVPA 150 |
| 3:00 - 4:00 | C.1 Bike Repair  
Co-Op  
The Heart  
C.2 Human/Nature Outdoor Ed. Env. Ed.  
C.3 Secularism Homophobia Paganism  
LBC 211  
C.4 Existentialism Brexit Domestic Work  
LBC 124  
C.5 Family Papers Archives Digitization  
Lilly Archives  
C.6 Videos Film Student Club  
Carp. 211  
C.7 Gender Equality Hjalla  
Carp. 212  
C.8 Rock Music History TEDTalk  
CVPA 150 |
| Special Evening Sessions | COSMOS Observation Night  
8:30 - ? || CST 103  
EC Film Festival Awards  
7:00-9:00 || LBC 105 |

⇒⇒ Interactive events
WEDNESDAY, APRIL 17

9:30 - 10:45

**Poster Presentations**
Covering all areas of the college
Druley Performance Gym

11:00 - 12:15

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<td>CST 300</td>
<td>Richmond Rm</td>
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12:15 - 1:30

**All Campus Lunch**
Cost = $4.50 for employees; standard meal plan for students
Runyan Center

1:30 - 2:45

**Awards Convocation**
Awards presented to student
Goddard Auditorium

3:00 - 4:00

**Earlham Day Festival**
Games, Bounce Houses, Prizes, Ice Cream
The Heart

↔ ↔ Interactive events
April 7 – May 11
Senior Art Majors’ Capstone Exhibition
Location: Leeds Gallery in Runyan Center

The senior art majors’ exhibit, *Place and Displacement*, will open with an Artists’ Reception on Sunday, April 7.

Creativity is on display in Leeds Gallery as the senior class of the Art Department exhibits their year-long Capstone Art Projects in a variety of mediums.

**Artists include:**
- Aux Girbach
- Beth Haselby
- Thomas Hill
- Ellen Johnson
- Arya Rana
- Cheng Andrew Zhen

Tuesday, April 16
Art Majors’ Art Sale
12:30 p.m. – 1:30 p.m.
Location: CVPA Atrium

The Earlham College Art Department will be hosting an Art Sale featuring the work of current students across multiple divisions. The participating mediums include medal work, photography, drawing/painting, ceramics, and fibers. This sale will allow you to meet each of the artists and engage with them about their work and processes, as well as be a chance to purchase original art works and art objects.
Tuesday, April 16
Tuesday Poster Session
9:30 a.m. – 10:45 a.m.
Location: Druley Performance Gymnasium in AWC

Presenters will be standing by their posters during the time listed above.
Posters will remain up until 4:00 p.m.

Posters are listed by placement in display area.
Please reference the “Tuesday Poster Session Layout” diagram on page 8.
Abstracts can be found at earlham.edu/epic-expo.

1. **Spring Cleaning with the Student Sustainability Corps and the CCE Career Closet**
   **Facilitators**
   The Student Sustainability Corps, The Center for Career and Community Engagement
   **Departments**
   Biology, EPIC
   **Keywords**
   Sustainability; Donations; Environmental; Spring Cleaning
   The Student Sustainability Corps and the CCE Career Closet invite students, staff, and faculty to do some Spring Cleaning! There will be a table during poster sessions for donations, so bring us all that old stuff you've been meaning to get rid of. This will help our end-of-year Move-Out Program go more smoothly. And, as always, the Free Store will be accepting donations. Help us help you!

2-8. **Environment, Science, and Sustainability Class: Long-term environmental monitoring on Earlham's campus**
   **Facilitator**
   Karen Mager
   **Department**
   Environmental Sustainability
   **Keywords**
   Environmental Science; Sustainability; Monitoring; Earlham Campus
   Long-term environmental monitoring projects measure environmental change over time and contribute to understanding its causes. Students in ENSU 151 Environment, Science, and Sustainability will present early findings of long-term environmental monitoring plans for the Earlham campus, and will make recommendations for how future classes of students can continue their research. Topics include monitoring of flowering tree phenology, wildlife activity on back campus, electricity usage by campus houses, soil quality at Miller Farm and in recent tree plantations, and campus “soundscapes”.

2. **Whistles and Warbles: The Relationship between Traffic Noise Pollution and Birdsong**
   **Presenters**
   Jared Ammon, Chloe Halsted, Katherine Hill

3. **How “dirty” can we get?: Disturbance effects on back campus soil nutrients**
   **Presenters**
   Martha Barefoot-Yeager, Olivia Daly, Jessi Fanini, Dorothy Weiss

4. Monitoring Earlham's printing and the effectiveness of intervention
Presenters
Connor Bray, Trevor Marimbire, Molly Mckellar, Jada Wilbanks

5. What's the Dirt on Miller Farm? The impact of organic farming methods on soils depleted by conventional agriculture
Presenters
Caleb Goldberg, Maddie Gullion, Mattie Spellman

6. Effectiveness of camera traps for monitoring waterfowl in Earlham's back campus
Presenters
Maya Claggett, Rosie Jacobs, Andy Strozewski

7. "Hey Bud, How's it Growin' 2.0"
Presenters
Sara Graham, William Norwood, Nora Collins

8. What types of animals occupy Earlham College’s marsh wetland and during what conditions are they active?
Presenters
Evan Feldberg-Bannatyne, Kate Neal, Claudette Roskamp

9-13. 2018 EPIC Advantage Research Program in Germany and the Netherlands
Facilitators
Becky Jestice, Robert Couch
Department
Global Management

9. Encounter Smart Cities
Presenters
Zhujun Li, Shenqi Zhai,

Keywords
EPIC; Video

I was in the EPIC Germany Student/Faculty Collaborative Research Experience with Becky and Robert. I would like to use a 4-minute video to present my Epic experience since I've graduated in 2018.
10. Cities Becoming Smarter: As Demonstrated by Buildings in Germany and the Netherlands

Presenter
Brittany Timmerman

Keywords
Smart Cities; Entrepreneurship; Germany; EPIC Advantage Trip

During the EC Epic Advantage trip to Germany and the Netherlands, tour guides described ways in which their cities were becoming smarter through creating sustainable buildings and finding new uses for buildings that no longer have value for the city. By exploring the ways in which other countries have accomplished this task, we can learn to apply these ideas to develop more sustainable buildings in the United States.

11. What’s the True Cost of European cities adopting ‘Greener Transportation’?

Presenter
Daniel Kibet

Keywords
Trade and Exports; Public Transportation; Environment; Air Pollution

In our German Epic Program, the government is embarking on a program of introducing car-free streets and zones in major cities while creating a major 100-mile biking highway to connect several cities including Duisburg, Essen, and Hamm. The highway will provide a commuting route for up to 2 million Germans which means close to 100,000 fewer cars on their roads and domestic demand for vehicles would decrease. But for a country whose automotive industry accounts for 15% of its GDP, what happens to the cars being manufactured. This presentation seeks to elicit discussion on how EU exports pollution as it attempts to adopt more environmentally friendly transportation methods.

12. Gentrification in Berlin, Germany

Presenters
Sophia Lombardo, Ashleigh Burton, Nam Nguyen, Krista Williams

Keywords
Gentrification; Germany; The Netherlands; Europe; Business; Tourism; Travelling

While traveling in Germany and the Netherlands for the May 2018 EPIC Advantage research, Ashleigh, Sophia, Krista and Nam noticed the overwhelming presence of gentrification, and the different kinds of neighborhood development happening specifically in Berlin. Nam investigated the historical roots of gentrification and how groups of people moved from one side of the city to the other. Sophia found herself interested in how the tourism industry was pushing local areas towards gentrification. Ashleigh and Krista focused on the social movements in Berlin that worked to preserve local neighborhoods and fight against gentrification. After returning to the United States for the Fall semester, further research was done to pull the three ideas together. At EPIC Expo 2019, the group will present their research.
13. **Environmental Entrepreneurship in Amsterdam**

*Presenter*
Xuechen Zhang

*Keywords*
Entrepreneurship; Environmental Sustainability; Woman Entrepreneur; Small Business; Tourism

This presentation will examine environmental entrepreneurship in Amsterdam, including its advantages and disadvantages; risks and benefits. It’s exemplified by a woman entrepreneur who started her own tourist company, aiming to feature Amsterdam from an environmental sustainable perspective to international visitors.

14-27. **Social Psychology Replication Projects**

*Facilitator*
Maggie Thomas

*Department*
Psychology

*Keywords*
Social Psychology; Research; Replication; Human Behaviors

These posters are small-group projects conducted by students in my Social Psychology course. Each group is trying to replicate a published social psychological study on campus.

14. **A replication of “Racial differences in gaze behavior during conversations: two systematic observational studies.”**

*Presenters*
Hephzibah Okorie, Joey Wan, Juana Serna Gomez, Weronika Zielinska

15. **A replication of “Influence of sex and dress on cooperation: An instance of ‘person’ chauvinism.”**

*Presenters*
Alexandra Swank, Hemanta Dahal, Thuong Nguyen, Hannah Nguyen

16. **A replication of “Hey buddy, can you give me 37 s of your time? Extension of the pique technique to a non-monetary solicitation and test of justification for compliance.”**

*Presenters*
Alaina Hoff, John Mahaney, Molly Puitz, Sijan Ikbal

17. **A replication of “Sex and setting effects on seating arrangement.”**

*Presenters*
Haley Owen, Shani Azoulay Grinspan, Taylor Stroud

18. **A replication of “Avoidances of an act which would violate personal space.”**

*Presenters*
Julia Schetelig, Kaitlynn Ketchem, Mason Whisman, Tsitsi Makufa
19. A replication of “Group size and the extension of social space boundaries.”
   *Presenters*
   Benjamin Pfeiffer, Brevin Smith, Magdalena Gallagher

20. A replication of “The size of informal groups in public.”
   *Presenters*
   Jackie Hernadez, Jasmine Amos, Tyrique Richardson

21. A replication of “Effects of facial expression and stare duration on walking speed: two field experiments.”
   *Presenters*
   Amal Tamari, Anika Phillips, Marianne Finot, Naomi Moed-Nelson

22. A replication of “Boundaries around social space: Dyadic responses to an invader.”
   *Presenters*
   Gaia Hendrix-Petry, Kinsey Emerson, Leslie Estrada, Natalia McIntyre

23. A replication of “Improving the Response Rate to a Street Survey: An Evaluation of the 'But You Are Free to Accept or to Refuse' Technique.”
   *Presenters*
   Charley Drew-Wolak, Jun Ho Na, Lillian Lowenfield-Jayne, Pyone Thant Win

   *Presenters*
   Kyle Barbour, Liam Wilkerson, Samuel Russo

25. A replication of “Passing encounters: Patterns of recognition and avoidance in pedestrians.”
   *Presenters*
   Adrian Torti Feener, Even Tyson, Ioni Robinson, Linnea Thorson

26. A replication of “Factors affecting courteous behavior.”
   *Presenters*
   Amelia Roeth, Cat Canino, Em Howard, Rebecca Hancock

27. A replication of “Direct look versus evasive glance and compliance with a request.”
   *Presenters*
   Erick Quintanilla, Jonah Roszczipka, Kevin Ventura
28-32. MGMT 306 Innovation Lab – Student Entrepreneurial Projects

Facilitator
Gene Hambrick

Department
Global Management

Keywords
Entrepreneurship; Non-Profit; Social Entrepreneurship

28. **Spellbound**
   
   Presenter
   Neil Nicholson

   Spellbound is a local co-op 2D side-scrolling platformer built in Unity. Players must work together to solve problems and reach goals at each level. Levels feature pushable crates, moving platforms, spikes, monsters and much more. Original art and music.

29. **Repurposing the Tivoli Theater Building**
   
   Presenter
   Rance Albert

   The Tivoli Theater building is an iconic building in downtown Richmond, Indiana. The building has been unused for years. Brent Mather (R&B Architects) has purchased the building and is beginning to develop ideas to repurpose the building. This project would be an opportunity to:
   1. Learn about economic development
   2. Develop ideas/initiatives to repurpose the building with an eye toward economic development for Richmond, Indiana.

30. **Refugee Art**
   
   Presenter
   Meghna Subramaniam

   - Over 6 million people live in managed refugee settlements outside their home countries
   - Livelihoods for refugees in settlements is a major challenge
   - Hundreds of talented artists work in settlements but without access to markets for their work
   - Create a sustainable social enterprise that:
     1. Provides livelihoods to artists working in refugee environments
     2. Generate funds for art and literacy programming for children in settlements
     3. Increase awareness of refugee situation in art-buying public
   - Online art sales in 2016 reached $3.17 billion
   - Pilot location (Uganda), Production Partner (Michael Birawer) and Online Platform (Shopify) in place

31. **Grow Pods**
   
   Presenter
   Danny Dopp

   Use shipping containers to grow produce using filtration systems to recycle water and reduce energy and resource waste.
32. **Work Stop**  
*Presenters*  
Chima Ndukwu, Daniel O'donnell, Emma Lady  

Near the college campuses in Richmond, IN there is a lack of walkable restaurants that fulfill three crucial aspects that are attractive to college students: a low price point, relatively fast service and hours that respect the college lifestyle. By adding both interesting and yet familiar menu items, [Wok Stop] would hope to cater to both the college campuses as well as the surrounding Richmond proper.

33-37. **Psychology Trade Fair**  
*Facilitator*  
Michelle Tong  
*Department*  
Psychology  
*Keywords*  
Psychology; Entrepreneurship; Research  

Students from PSYC115: Introduction to Psychological Perspectives, for a group project, will be designing programs or products that "improve people's lives." The only stipulation is that the aspects of programs/products must be supported by research in psychology. At our trade fair, students will be proposing the ideas for the programs and products. We invite you to come and explore what psychology can contribute to the world.

33. **Group 1**  
*Presenters*  
Oliver Daniel, Rachel Deckert, Uyen Pham, Jared Stone

34. **Group 2**  
*Presenters*  
Kiara Kamara, Kevin Nguyen

35. **Group 3**  
*Presenters*  
Ethan King, Sheldan Lindsay, Alexandra Livesay, Annemarie Reinhard

36. **Group 4**  
*Presenters*  
Clio Holman, Jessica Kelliher, Caroline Mulvihill, Emma Stinson

37. **Group 5**  
*Presenters*  
Molly Mckellar, Giselle Mora, Willa Summers, Luz Tafradjiyski Mostacero
Technology and its Influence on Societies Around the World

Facilitator
Safia Diarra

Department
ELL, Earlham Seminar

Keywords
Group Poster Presentations

Students were asked to complete posters related to a new technological device. They were expected to research when the device was created, what the purpose of the device is, who it serves and how they believe this device will affect our society in the future.

38. Group 1
Presenters
Hailee Dang, Khoa Nguyen, Maida Raza

39. Group 2
Presenters
Abdul Khurshid, Dipesh Poudel, Manami Dote

40. Group 3
Presenters
Kofi Ayensu, Nikos Trikka Psomas, Lam Hoang

41. Group 4
Presenters
Denise Bergdolt, Tamara Blagojevic, Melissa Valesquez Elias

42. Group 5
Presenters
Phan Nguyen, Quan Tran, Long Le

43. Group 6
Presenters
Aryaan Shrestha, Nahom Zewde

44. Group 7
Presenters
Sarthak Sharma, Gordian Bruns

45. Group 8
Presenters
Winnie Nguyen, Sumin Park

46. Group 9
Presenters
Kim Kang, Jun Ho Na

47. Food Insecurity in Richmond: A Reality Check
Facilitator
Students from the Zero Hunger course will display and present information about food insecurity in our locality. They will provide additional background about the work of the Zero Hunger course, local resources to address food insecurity and potential projects and community collaborations going forward.

48. Medical Humanities at Earlham College

Presenters
Maleeka Shrestha, Khyrul Khan, Denisha Mataia, Leticia Kulwa Maganga

Departments
English, Ancient and Classical Studies, Philosophy, Psychology, Religion, Sociology and Anthropology, Center for Global Health

Keywords
Vibrant; Informational; Useful

This poster will outline the medical humanities integrated pathway at Earlham College. It will illustrate how it came to be, the two main players in this endeavor, participating departments, the main objectives of this integrated pathway and integrated pathways as a concept, basic requirements of the IP and why we, as the first cohort, decided to pursue this integrated pathway.
49. **Evaluating the Chemistry and Biological Action of Midwestern Medicinal Plants**

*Presenters*
Nguyen-Anh Nguyen, Rafaella Shima, Alex Abelkis, Jasmine Carter, Claire Cornwell

*Department*
Chemistry

*Keywords*
Aging; Medicinal Plants; Phytochemical; Antioxidant Capacities; Heat Stress

Literature has demonstrated Caenorhabditis elegans possess similar cellular mechanisms when responding to toxic stress and increasing lifespan. In addition, a plant-based diet with antioxidant activity and high phenolic content are associated with increased health. We tested the hypothesis that medicinal plant extracts would improve C. elegans survival rates when exposed to toxic (hot and cold temperature) stresses. The chemical content and biological activity of mulberry, goldenrod root, goldenrod leaf, blue violet, black raspberry, and red root plant extracts were measured and their compound class fractions (anthocyanin, flavonol, tannin, and phenolic acid). We found that with increased phenolic content, extracts had higher antioxidant activity; this correlation is largely attributed to anthocyanin content. Additionally, phytochemicals not isolated in our fractions and/or synergistic interactions contributed to the overall antioxidant capacity of extracts. We did not find a correlation between antioxidant capacities and C. elegans survival rate under toxic stresses. However, mulberry (50 \( \mu \text{g/mL} \)) significantly increased the survival rate in response to cold stress and blue violet (400 \( \mu \text{g/mL} \)) extract treatment trended towards increased survival rate in heat stress. This research is a preliminary step for further study and discussion to understand the comparison between medicinal plant activity and C. elegans survival and longevity.

50. **GIS within Wayne County Government**

*Presenter*
Haki Johnson

*Department*
Geology

*Keywords*
GIS; Local Government; Indiana

This presentation will include examples of the work that I have completed over five months working for the Wayne County Surveyors office. Within the display, I will explain the role that Geographic Information Systems (GIS) has within local government, and the various ways it is used to make vital information communicated efficiently.

51. **Habitat Preference of Vines between Lowland and Upland by Tree Species**

*Presenters*
Emma Stinson, Wesley Smith, Sam Pigott, Paton Bubb

*Department*
Biology

*Keywords*
Vine species; Tree species; Upland; Lowland

It is not yet known whether vine species prefer one habitat type over another. We are collecting data on four tree species and three vine species across two habitats. The four tree species surveyed are Black Cherry, Black Walnut, Tulip, and Sycamore (lowland)/Beach (upland). The three vine species surveyed are Grape vines, Poison Ivy, and Virginia Creeper vines. We are surveying 32 individuals per habitat using Sycamore and Beach as our random number generators. We hypothesize that both vine load and number will be higher in the lowland. Data collection is still in progress.

52. **Edge and Aspect Effects on Invasive and Native Shrubs in Itsy Bitsy Woods**
In this project we are looking at edge effect in the undisturbed old growth woods named Itsy Bitsy in terms of the number of each species of shrub present as well as their size. The four different edges of Itsy Bitsy woods receive different amounts of sunlight due to their aspect, potentially resulting in varying species densities present on each edge and in comparison to the interior. By collecting data on all the individuals that live on the edges of Itsy Bitsy we are investigating if shrubs, especially certain species, are affected by aspect and sunlight exposure when they invade different edges of the forest. We are also interested if species composition changes based on location. We hope to determine if there is a significant difference in the shrubbery on each of the edges and the interior to determine the extent of edge effect on Itsy Bitsy Woods.

53. **There could be Zoonoses in Your Backyard!**

**Presenters**
Hannah Claire Canady, Wesley Smith

**Departments**
Environmental Sustainability, Biology

**Keywords**
Illegal Wildlife Trade; Zoonotic Diseases

The illegal wildlife trade is, in part, responsible for the introduction of infectious diseases to the United States from other parts of the world. This spreading is caused by trade in animal skins, leather goods or souvenirs, food or traditional medicine, or as pets. The rate of infection will only get worse as globalization increases and climate change affects species ranges. These diseases can be transferred from exotic animals to domestic animals and then to humans, where there can be lethal consequences. This poster will focus on exploring how these diseases move and potential solutions, which include international cooperation between NGOs, national governments, and local peoples to identify where these infectious diseases are coming from, what their vectors are, and where these animals are ending up.

54. **Get Trashy (Where does our Waste Go at Earlham?)**

**Presenters**
Katie Jacobs, Marcella Lanzillotti, Alex Breuhan,

**Department**
Environmental Sustainability

**Keywords**
Environmental Sustainability; Student Sustainability Corp.; Waste; Recycling; Composting

Our presentation focuses on the waste streams at Earlham (trash, recycling, composting). It explains what happens to the waste put in each stream and the respective environmental impacts. Currently, Earlham has a high contamination rate. In some areas on campus 75% of waste that could be diverted to recycling, composting, or reused ends up in the trash. Therefore, we hope to look at some of the common items found at Earlham and discuss what should be done with them.
11:00 a.m. – 12:15 p.m.

A.1 Science Variety Session
↔ Location: CST 103

A.1.1 Meet Our Robotic Animals

*Facilitators*

*Departments*
Neuroscience, Psychology, Computer Science

*Keywords*
Robots; Animal Behaviour; Interactive

This semester, our class (CS/PSYC340) is building "robotic animals." Groups of students use VEX IQs to construct robots with life-like behaviours, and we'd like to show these off to the Earlham community. Our "animals" demonstrate that complex behaviours can arise from very simple computations.

A.1.2 Marvelous Materials of Science and Their Fascinating Properties - Interactive Demos and Activities

*Facilitators*
Patrick Barber, Eila Ahonen, Abigail Armstrong, Abduselam Awol, Madeline Honig, Swati Pant, Leilah Petit, Hieu, Pham

*Department*
Chemistry

*Keywords*
Science; Chemistry; Materials; Interactive; Demonstration

Ever wondered how plastics are made? Why some are flexible and others are rigid? How can the material in a diaper soak up and prevent a terrible mess? The variety of materials you encounter in your everyday life is startling. We, the Materials Chemistry, are here to help! Come join us for a series of interactive demonstrations that will have you walking away feeling a little closer to the materials you encounter every day. Come see electrically conductive materials that light up your life, magnetic materials that levitate, and perhaps some good old liquid nitrogen fun.
A.2 Forget The Classroom-- What counts as learning?
Location: Richmond Room in LBC
Facilitator
Jay Roberts
Presenters
Adrian Feener, Katie Jacobs, Thea Clarkberg
Department
Environmental Sustainability
Keywords
Outdoor Education; Environmental Education
This panel will feature three research presentations from the ENSU 210 Course on Outdoor and Environmental Education. Student presentations include "Exploring Learning Outcomes of Adventure Play vs. Traditional Classrooms", "What Craft and Culture Can Teach Us", and "Learning Through Outdoor Play."

A.3 Personal Politics: Labor, Kinship, and the Struggle for Workplace Justice
Location: LBC 208
Facilitator
Ryan Murphy
Presenters
Perla Cervantes, Jada Wilbanks, Fletcher York
Departments
African and African American Studies, History, Peace and Global Studies, Women’s Gender and Sexuality Studies
Keywords
Labor History; WGSS; African American History; Latinx Studies; LGBTQ Studies
This panel presentation explores the family history of three Earlham students to understand the struggle for economic justice in the twentieth and twenty first centuries. Kinship networks function in two ways in these talks. First, the participants will discuss how economic pressures – from long hours on the job to compulsory migration to lack of access to food, safe working conditions, and education – have placed an undue burden on people’s families. Second, family has been a site of resiliency for these students, a means to mitigate financial hardship and to inspire activist movements that fight for better pay and working conditions. The specific topics covered in the presentation include family labor in the Florida agricultural industry, union activism among African American residents of Cleveland after the Great Migration, and a family’s struggle with deindustrialization in Fort Wayne, Indiana. The panel’s title draws its inspiration from 1970s feminists who theorized the political potential of personal narrative, and routes those older ideas through new, intersectional and transnational work in labor history, ethnic studies, and history of sexuality.
A.4 Liberal Arts Variety Session
Location: LBC 211

A.4.1 Ouch! That is Just Wrong: Replicating Studies that Influence Pain Perception and Moral Judgments

*Presenters*
Beth Mechlin, Alex Abekis, Alyssa Arboleda, Vanessa Duran, Arish Rakshasa, Carley Carpenter, Isabel Morales, Molly Rannebarger

*Department*
Neuroscience

*Keywords*
Pain; Morality; Replication; Neuroscience

Two groups will be presenting the results of their replication research projects for Behavioral Neuroscience. One group is attempting to replicate a 2014 Pulvers et al. article titled “Computer-delivered social norm message increases pain tolerance.” Participants in this study received a gender-specific message through a pre-recorded video then performed the cold pressor task. Few experiments have tested social determinants of pain tolerance. The second group is trying to replicate the experiments conducted by Eskine, Kacinik, & Prinz (2011) to study the influence of gustatory disgust on moral judgement. Judgements of morality are critical in defining societal norms that determine whether a practice is acceptable in a given cultural context. They hypothesized that individuals who drink a bitter beverage would exhibit harsher moral judgements than those who drink a sweet or neutral-tasting beverage while rating moral vignettes.

A.4.2 Theologizing Islam: Rethinking the "Islam" in Political Islam

*Facilitator*
Ahmed Khanani

*Presenters*
Laura Kelly, Lillian McDevitt-Bayless, Shabnam Fayyaz, Srija Banerjee

*Departments*
Politics, Religion

*Keywords*
Islam; Theology; Political Science

Although political scientists regularly develop nuanced depictions of Islam and Muslims, most still imagine Islam in essential terms. Even scholarship that deals with “sects” often presents the Shi’a and Sunni traditions as easily differentiated, ahistorical totalities. In short, many political scientists narrate Islam as a discrete entity with definite boundaries. In contrast, we propose thinking of “Islam” as, instead, “the Muslim tradition.” This shift from “Islam” to “Muslim tradition” allows secular, Western-trained scholars to avoid what we call “theologizing Islam.” Political scientists regularly, if tacitly, afford Islam a theological core: this creates two significant issues. First, academics inadvertently write self-identifying Muslims out of Islam, e.g., by way of affording Islam a core at odds with the beliefs of minority groups (e.g. Ahmadiyyas are regularly removed from “Islam”). Second, when scholars essentialize Islam, scholarship loses observational and explanatory value. If, for example, a scholar describes Islam in Salafi terms Islam and thereby identifies Sufi practices of worship as extra-Islamic (e.g. by coding them as “cultural,” not properly religious), this scholar would altogether miss specific instantiations of the Muslim tradition. To illustrate these arguments, we track uses of “Islam” over five years in eight journals and highlight instances of theologizing Islam.

A.5 Liberal Arts Variety Session
A.5.1 World Organisation Against Torture (OMCT) SOS-Torture Network

**Presenter**
Caitlin Corrigan-Orosco

**Departments**
International Studies, Politics

**Keywords**
Summer Internship Presentation

Caitlin interned for the World Organisation Against Torture (OMCT) SOS-Torture Network in Geneva, Switzerland during the Summer 2018. Caitlin will discuss her responsibilities from conducting research on the Istanbul Protocol, representing the organisation at the 64th Committee Against Torture at the Office of the UN High Commissioner for Human Rights and 38th Human Rights Council at the UN Headquarters, along with assisting in grant writing and social media marketing.

A.5.2 Mental Health Activism at Earlham

**Presenters**
Ellie Haland, Reggie Grossman, Nathan Metz-Lerman

**Department**
Interdepartmental

**Keywords**
Activism; Mental Health; Student Social Action

From hearing and experiencing the lack of support for people struggling with their mental health at Earlham, we are a group of students working to gather information on mental health here and take action to improve it.
A.6 Spanish 102 and 202 Session
Location: Carpenter 211

A.6.1 Spanish 102 Short Film Prize Winners
Facilitator
Belén Villarreal, Paul Cella, Isaura Contreras Rios, Juan Gabaldon-Vielma

Presenters
Students in Spanish 102

Department
Spanish and Hispanic Studies

Keywords
Short Film; Spanish; Foreign Language

Students in all 4 sections of Spanish 102 worked in small groups to create short fictional films based on the topics of travel, work, and/or the stages of life. Students in each class watched all of their classmates' films and then reached consensus as to the best one. These 4 winners are the ones being shown today. Please note that the videos will not have English subtitles.

A.6.2 Abogando por Amigos: Español para la justicia social / Advocating for Amigos: Spanish for Social Justice
Facilitator
Belén Villarreal

Department
Spanish and Hispanic Studies

Keywords
Spanish; Social Justice; Community Service; Amigos

This presentation is a bilingual description of the class project that students undertook in the Fall of 2018, for SPAN 202: Spanish for Social Justice. After being instructed that they would work on a semester-long advocacy project for an organization of their choice, students chose to support Amigos, the Latino Organization in Richmond. Two groups created videos to promote the many activities that Amigos offers, while another set of students volunteered time every week to care for children of adult Amigos English students while they took English classes. The presentation will include a brief description of the project, students' reflections and the 2 videos they created (one last 7:12 and the other 2:35).
A.7 Liberal Arts Variety Session  
Location: Carpenter 212  

A.7.1 Cohousing in Berlin  

_Presenters_
Ish Khan  

_Department_
Global Management  

_Keywords_
Cohousing; Berlin; Germany; Shared Office; Community  

Cohousing is the practice of intentionally designing homes that share a common space among multiple units, individuals and families. During the EPIC trip to Germany, I was exposed to a high-functioning cohousing community and that helped me to understand the merits and promise of such a concept. It is a timely topic due to the increased tension in urban areas over gentrification, overpopulation and socio-cultural changes.  

A.7.2 Advancement of Afro-Descendants in Brazil  

_Presenter_
Paloma Collazo-Vargas  

_Departments_
African and African American Studies, History, Politics  

_Keywords_
Urban Violence; Affirmative Action; Race Relations  

This summer research is about race relations in Brazil, specifically the advancement of Afro-Brazilians. Three modules correspond to each city; Urban Violence in Rio de Janeiro, Empowerment of Quilombos in Salvador and Affirmative Action and Public Policies in Brasilia.  

A.7.3 Graying Japan: Social Implications and the Rise of Robotics  

_Presenter_
Aidan Schrier  

_Department_
Japanese Language and Linguistics  

_Keywords_
Japan; Aging Population; Companionship  

In recent years, Japan has faced a rapidly aging population. This presentation investigates the causes, effects, and possible solutions to this population shift, with a focus on the role that robotics are playing in modern and future Japan.
A.8  **From Attic to Archive: Treasures at Earlham**  

**Location:** Earlham Archives in Lilly Library  

**Facilitators**  
Jenny Freed, Tom Hamm  

**Department**  
Library  

**Keywords**  
History; Archives; Rare Books; Preservation  

Curious about rare books? Interested in Earlham’s history? Ever wondered how Archivists preserve digital records? Join Tom Hamm and Jenny Freed for a presentation on Earlham’s Friends Collection and College Archives. Topics will include information on preservation of physical and digital records, the treasures in the College Archive, and some amazing stories. The College Archives can be found in the basement of Lilly Library, just take two rights at the bottom of the stairs.
Tuesday, April 16
Session B
1:30 p.m. – 2:45 p.m.

B.1 The Perfect Human: How CRISPR Technology is Changing the World

Location: CST 103

Presenters
Alberto Edwards, Alena Hornak, Anthony Luis, Ariadna Sanchez Villalpando, Charles Burton, Chelsea Jones, Emi Smith, Em Howard, Hannah Wallhauser, Ian Murray, KD Hart, Amelia Nguyen, Pablo Rios-Cruz, Rachel Deckert, Zoe Kihlstrom

Department
Earlham Seminar

Keywords
CRISPR; Genome Editing; Designer Babies; Disease Cures

Our seminar has explored the game-changing new genome editing technology: CRISPR. In our workshop, you will be exposed to facts about the use of this tech, including its history and current achievements, limitations and complications. We will talk about the current debate over editing the human genome and the controversy over the claim of He Jiankui's Chinese twins born with edited genomes. You will also have the chance to engage in discussion of the ethics of using this technology. We encourage folks from all areas of the college to engage in this critical discussion. How should humanity proceed? What future should we build?

B.2 Policy Briefs on US Environmental Issues

Location: LBC 208

Facilitator
Jamey Pavey

Presenters
Levan Apkhaidze, Kobi Eng, Katherine Hill, Marcella Lanzillotti, Manuel Rodriguez, Claudette Roskamp

Department
Environmental Sustainability

Keywords
Environment; Policy; Sustainability; Analysis

Students in ENSU326 US Environmental & Natural Resource Policy will present policy briefs on the following topics: microplastics, methane from landfills, endangered species, incentives for renewable energy, control of invasive species, and mountaintop removal mining. Each policy brief will provide background on the issue, describe current policies, and propose policy changes to improve upon existing conditions.
B.3 Coaching with an Experiential Approach  
Location: Richmond Room in LBC  

Facilitator  
Jay Roberts  

Presenters  
Henry Wildes, Bini Tumbo, Shi Bellingham  

Department  
Environmental Sustainability  

Keywords  
Outdoor Education; Environmental Education  

This panel will feature three research presentations from the ENSU 210 Course on Outdoor and Environmental Education. Student presentations include "Learning to Coach through Experience," "Best Practices in Modern Coaching," and "Critical Thinking in Sports."  

B.4 Sociology/Anthropology: Adventures in Ethnography  
Location: LBC 211  

Facilitator  
JoAnn Martin  

Presenters  
Megan Howell, Leanne Le Zhi Cheong, Bronwen Evans, Mihnea Balan, Maria Landin, Ramzi Khalif  

Department  
Sociology and Anthropology  

Keywords  
Ethnographic Research; Embodiment; Force  

The papers in this session deploy the sociological/anthropological imagination to explore the variety of topics our seniors have researched using ethnographic methods broadly defined. In some cases, the research is based on participant observation as in Richmond’s roller derby team (Megan Howell) and Leanne Cheong’s research on the precarious nature of belonging and non-belonging that many Asian students experience on campus. Bronwen Evans analyzes the sartorial practices associated with kingship in Swaziland while Mihnea Balan using the lens of shamanism to examine human relationship to non-human animals. Drawing on the film Roma, Maria Landin, examines race, class and domestic labor as structures of inequality are embodied in the interactions and events portrayed in the film. Ramzi Khalif explores the interactions between comedians and their audiences as a set of force relationships created to provoke reactions, particularly around sensitive subjects.

B.5 Bonner Scholars Panel
Location: LBC 124

B.5.1 Leadership & Service: A Bonner Panel

Presenters
Brittany Timmerman, Sophia Lombardo, Daisy Rangel, Dennis Vera

Department
Bonner Scholars

Keywords
Bonner; Service; Richmond; Leadership; Senior

Come speak with senior Bonners about how service has impacted our leadership skills. Ask us questions about getting out into the community and making a difference. Hear about leadership styles and service experiences.

B.5.2 Off Campus Programs through the Lens of Bonners

Presenters
Minhwa Choi, Shanda Workman, Diana Marino, Evelyn Sanchez

Department
Bonner Scholars

Keywords
Off-Campus Programs; Service; Bonner

A Bonner Panel on the Richmond community presenting the differing perspectives attained by Bonner Scholars throughout their service experiences. Bonner Scholars will share stories of the service they have completed and how these experiences have informed their understanding of the people, places, and politics of Richmond.
B.6 The Development of “Misadventures”
Location: Wilkinson Theatre in Runyan Center

Facilitator
Lynne Perkins Socey

Presenters
Victor Baker, Grace Beavin, Chiara Bowker, Madison Dilk, Madi Eads, Nicole Hankins, Ari Higley, Gabriel Lessing, Brianna Miller, Grace Nickeson, Spencer North, Ruthie Reichman, Benjamin Roussell, Laurence Ruberl, Alex Sobczak, Nathan Sullivan, Sarah White, Jordan Wolfe, Monica Wuertemberger

Department
Theatre Arts

Keywords
Theatre; Research; Collaboration; Adaptation; Steampunk

The eighteen students involved in the collaborative development and performance of THE MISADVENTURES OF MARTIN HATHAWAY at the Edinburgh Festival Fringe in Scotland this August, will share about their process of research, experimentation, and rehearsal. Adapted by Associate Professor Lynne Perkins Socey from the novel by local writer Kathryn Clare Glen, students are finding innovative ways to stage steam-punk fantasy adventure sequences for a low budget touring production. Come learn how students are applying their research, partnering with various members of the greater Richmond community, documenting their process, and developing digital storytelling and podcast programs designed to create community and promote the show (and the novel). Attendees will be asked to offer feedback about staging and design experiments. Full preview performances will be on campus April 25, 26 & 27th.

B.7 History of Rock Song Analysis Presentations: Part 1
Location: CVPA 150

Facilitator
Keith Cozart Steele

Presenters

Department
Music

Keywords
History; Rock Music; TEDTalk

Student groups from the class History of Rock present a multimedia event lasting 18 minutes or less in the form of a TEDTalk. Presentations are song analysis driven with students describing in plain language the historic, musical, emotional, political, social, and economic aspects of a specific song from Rock music history. A short Q&A follows each presentation. These presentations will continue in Session C.
Tuesday, April 16
Session C
3:00 p.m. – 4:00 p.m.

C.1 Cycling into Spring: Bike Repair on the Heart

Location: The Heart

Facilitators
Sam Pigott, Jared Ammon, Eva Wetzel, Maddie Gullion

Department
Environmental Sustainability

Keywords
Bike; Repair; Co-Op; Share

Join the Bike Share and the Bike Co-Op on the Heart for some quick repairs in anticipation of warmer weather! Participants are invited to bring their bikes and learn how to do the repairs themselves. This will also be an opportunity to sign up for the Bike Share and hear more about upcoming events.

C.2 Recognizing Eco-Connection: An Exploration of the Human/Nature Divide

Location: Richmond Room in LBC

Facilitator
Jay Roberts

Presenters
Paolo Rossi-Evans, Jordan Lehman, Gaby Corrales

Department
Environmental Sustainability

Keywords
Outdoor Education; Environmental Education

This panel will feature three research presentations from the ENSU 210 Course on Outdoor and Environmental Education. Student presentations include "The Outdoors: An Ancient Super-Healer," "Eco-Feminism and the Environment," and "Breaking it Down: The Human-Nature Divide."

C.3 Laïcité, Pagan Delegitimization, and Cold War Homophobia: An Earlham Historical Research Panel

Location: LBC 211

Facilitator
Elana Passman

Presenters
Opal Harbour, Ali Touilila, Emily Rosenberger

Department
History

Keywords
History; Research; Secularism; Homophobia; Paganism

Three presentations of research completed by students from the fall semester Research Methods in History course. These projects focus on secularism in France, homophobic federal policy in the 1950s, and the historical delegitimization and appropriation of Pagan religious tradition.
C.4 Liberal Arts Variety Session
Location: LBC 124

C.4.1 The Forgotten Solution to Existentialism

Presenter
Victor Lane

Departments
Philosophy, Religion

Keywords
Existentialism; Nihilism; Keirkegaard; Nietzsche; Solution

Nietzsche famously gave the proclamation that "God is dead. God remains dead. And we have killed him"; warning of the waves of nihilism that would wash away culture when there is nothing foundational to believe in. In fact, with the popularity of shows like Rick and Morty and Bojack Horseman it would seem it has even become a joke to us at how pervasive nihilism is in our culture. My central argument and thesis is that the one writer who best provides an answer to Nietzsche was a Danish philosopher and theologian who wrote decades before him; Soren Kierkegaard. My Presentation is on this Christian Existentialist Philosopher. Specifically, I will be talking about the three categories in which he divides human existence; The realm of the aesthetic, the realm of infinite resignation, and the realm of faith. I will be basing my presentation on a number of sources and lectures; but chief of which will be Kierkegaard's Either/Or and Fear and Trembling. Ultimately I will be showing how through Kierkegaard's teachings we can overcome existentialism and avoid nihilism.

C.4.2 European Citizens, Polish Vermin: The Biopolitical Consequences of Brexit on Polish Domestic Workers in London

Presenter
Nicole Gruszka

Departments
Peace and Global Studies, Politics, Women's Gender and Sexuality Studies

Keywords
Brexit; Migration; Domestic Work; Biopolitics; European Union

On June 23th, 2016, the United Kingdom held an election determining the future of its EU membership status, with 51.89% of voters ultimately deciding to leave, or rather, to Brexit. The campaign itself relied heavily on the popular but often tacit xenophobic sentiments held by white Britons against Eastern European migrants, and especially against Poles, but the aftermath of the vote has dramatically shifted the biopolitical positionality of these already-precarious populations. This presentation will examine field research conducted in London in the spring of 2018, in which 9 Polish women employed as domestic workers were interviewed about the ramifications of the Brexit vote on their lived experiences of sociopolitical agency, personal safety, citizenship, and labor protections. These interviews will be contextualized by an analysis of relevant biopolitical theory, especially pertaining to the construction of borders, gender, racialization, and precarity. The presentation will conclude with an examination of the ramifications of Brexit - which, at the time of writing, is scheduled to occur in 10 days with no deal in sight - which will have transpired by the time of the presentation.
C.5  How to Preserve Your Family Papers Like an Archivist
Location: Earlham Archives in the basement of Lilly Library

Facilitator
Jenny Freed

Keywords
Family Papers; Archives; Digitization

Ever wondered what to do with your great-grandparents' love letters? Or the photographs of your grandparents? Come to the Friends Collection and College Archives to learn how to preserve your family treasures like an Archivist. We will show you the sort of supplies you could use, answer questions, and chat about the basic science of archival preservation. Feel free to bring a few items with you, and we’ll talk about how to preserve them. (Note: Archival supplies are expensive, so we will only be providing knowledge in this session.)

C.6  Earlham Film Festival
Location: Carpenter 211

Facilitator
Hanh Le

Department
Student Club

Keywords
Videos; Films; Time

Earlham Film Project is a student club focusing on the interest of video production and film critique. This year, EFP will be hosting Earlham Film Festival, which is a film competition open to everyone to the Earlham Community. Submissions of the Film Festival will be shown as a celebration of Earlham's creativity. Our theme for this year's festival is "Time"

C.7  Come and Hjalla with Me!
Location: Carpenter 212

Presenters
Cynthia Grinspan, Shani Azoulay Grinspan

Keywords
Gender Equality; Hjalla Methodology; PowerPoint Presentation; Lecture; Q&A

A lecture/presentation/introduction on the Hjalla method and principles. Hjallastefnan in Iceland is the institution behind the Hjalla method based on the development of human beings as individuals, maximizing their strengths to the fullest and gender equality among all.
C.8 History of Rock Song Analysis Presentations: Part 2
Location: CVPA 150

Facilitator
Keith Cozart Steele

Presenters

Department
Music

Keywords
History; Rock Music; TEDTalk

Student groups from the class History of Rock present a multimedia event lasting 18 minutes or less in the form of a TEDTalk. Presentations are song analysis driven with students describing in plain language the historic, musical, emotional, political, social, and economic aspects of a specific song from Rock music history. A short Q&A follows each presentation. These presentations are a continuation from Session B.
Tuesday, April 16  
Evening Events

Earlham Film Festival Award Ceremony  
7:00 p.m. – 9:00 p.m.  
Location: LBC 105

Years ago, the Student Filmmakers Guild had organized Earlham Film Festivals as a celebration of Earlham’s creativity. The goal of the festival is to bring students who are interested in films together so that they can share their art, in a competitive, yet friendly atmosphere. Earlham Film Project is reviving this tradition by hosting Earlham Film Festival 2019 with the theme of “Time.” For the conclusion of the Festival, please join us at the award ceremony to watch the submissions, vote for your favorite, and celebrate the winners!

COSMOS Observation Night  
8:30 p.m.  
Location: CST 103

Come have a fun and educational night learning about space. People will have the chance to come to a Star Talk and learn about a specific topic in Astronomy before, weather depending, we go out to the observatory to look through our telescope or go into our planetarium for a show.
Wednesday, April 17
Special Events

**Athletics Breakfast**
8:30 a.m. – 10:00 a.m.
Location: Earlham Dining Hall
*Please note: Breakfast is by invitation only*

This breakfast is to celebrate all of Earlham’s student athletes.

**All Class Gift**
9:30 a.m. – 10:45 a.m.
Location: Athletics and Wellness Center

Join Earlham students in supporting student financial aid and scholarships with the 2019 All-Class Gift. This year the All-Class Gift Committee is raising funds for the Earlhamite to Earlhamite Annual Scholarships. These scholarships will help three deserving students in the 2020 school year. Make your gift on Earlham Day by visiting the All-Class Gift table in the AWC during the Wednesday poster session or at the Earlham Day Festival.

*Unite! Give! Inspire!*

**Bonner Dinner**
6:00 p.m.
Location: Comstock Room
*Please note: Previous RSVP for dinner required.*

The 2019 Earlham College Bonner Senior Dinner & Celebration of Service is on Wednesday, April 17. Dinner will be served at 6 p.m.

*Awards being honored include:*
- David Koch ’66 Award in Public Service recipient
- Karen Keller LaFollette Award recipient
- Community partner person of the year award recipient
- Community partner agency of the year award recipient
- Faculty collaborator of the year

**Bonner Class of 2019**
- Eleanor Batista-Malat
- Minhwa Choi
- Cait Conley
- Sophia Lombardo
- Diana Marino
- Blanca Ortiz
- Dante Petti
- Daisy Rangel
- Ethan Rountree
- Joe Ryan
- Rachel Sames
- Evelyn Sanchez
- Dennis Vera
- Kevin Whited-Ford

**Bonner Class of 2020 members graduating December, 2019**
- Jim Bowie
- Brittany Timmerman
- Shanda Workman
Wednesday, April 17
Wednesday Poster Session
9:30 a.m. – 10:45 a.m.
Location: Druley Performance Gym in AWC

Presenters will be standing by their posters during the time listed above. Posters will remain up until 4:00 p.m.

Posters are listed by placement in display area. Please reference the “Wednesday Poster Session Layout” diagram on page 9. Abstracts can be found at earlham.edu/epic-expo.

1. Spring Cleaning with the Student Sustainability Corps and the CCE Career Closet
   
   **Facilitators**
   The Student Sustainability Corps, The Center for Career and Community Engagement

   **Departments**
   Biology, EPIC

   **Keywords**
   Sustainability; Donations; Environmental; Spring Cleaning

   The Student Sustainability Corps and the CCE Career Closet invite students, staff, and faculty to do some Spring Cleaning! There will be a table during poster sessions for donations, so bring us all that old stuff you've been meaning to get rid of. This will help our end-of-year Move-Out Program go more smoothly. And, as always, the Free Store will be accepting donations. Help us help you!

2. Global Issues and Local Initiatives
   
   **Facilitator**
   Jennifer Cardinal

   **Presenters**
   Lydia Evans, Leticia Kulwa Maganga, Lucia Burton, Schuyler Kempton, Della Walters

   **Departments**
   Environmental Sustainability, Sociology and Anthropology

   **Keywords**
   Sustainability; Health; Iceland; UK

   In this EPIC Research Term, we prepared for our future research comparing sustainable development and community public health initiatives in urban and rural sites in Iceland, the United Kingdom, and the United States. We learned how to conduct preliminary ethnographic research, including forming research questions and research design in a comparative context. We conducted preliminary explorations of a range of sites, including public health programs, visits to drug policy organizations, sites of sustainable tourism development, urban and community gardens, and more. We explored the connection and disjuncture between various vectors of community well-being, and between community places and practices. How are these global issues addressed in local contexts? Are different approaches taken in urban and rural contexts? How do community health and sustainable development practices compare in different national contexts? What is the relationship between public health and environmental, economic, and sociocultural sustainability?

3. Visualizations and Insights on College’s Water and Electricity Usage
The proper and efficient use of water and electricity is important for campus sustainability. This poster presentation explores Earlham College’s water and electricity usage data in 2018. With the help of visualizations, this poster focuses on key findings related to energy and water usage in college houses and other campus buildings. The ultimate goal is to encourage the campus community to use these resources in an efficient manner for campus sustainability.

4. Meeting the Local Coyotes: A Camera Trap Investigation of Canis latrans Interactions and Activity in Two Habitats near Richmond, IN

Presenter
Celia Carr

Departments
Biology, Environmental Sustainability

Keywords
Coyote (Canis latrans); Behavioral Ecology; Camera Trap

Canis latrans (the coyote or “song dog”) is a medium-sized carnivore with an extensive and expanding range which covers much of North America. Coyotes exhibit great intraspecific variation in social organization and social behavior, leading transitory or residential lives solitarily, in pairs, or in packs. I examine coyote activity recorded by trail cameras (“camera trapping”) located at two adjacent but distinct habitats (prairie edge and stream bed in deciduous forest) to learn about general patterns of coyote interactions and activity near Richmond, IN. I endeavor to develop an understanding of the social organization and habitat use of local coyotes through a comparison of coyote activity at the two sites, using camera trap photos to characterize and quantify behavior, social organization, and trends in coyote location. Additionally, I examine correlations between moon phase, coyote activity, and habitat use. “Meeting” the local coyotes by beginning to develop a baseline understanding of their behavior and whereabouts might facilitate and deepen relationship to place and encourage thoughtfulness in planning activities and human-coyote interactions.
5. **Monoculture No More: Farming for Biodiversity**

*Presenters*
Alexis Warren, Katie Jacobs

*Department*
Biology, Environmental Sustainability

*Keywords*
Conservation; Biodiversity; Sustainable Agriculture

As the world population expands and the need for food production and farmland increases, farming practices that coexist with the surrounding environment are becoming more important if those ecosystems are to be conserved. Dominant agriculture practices today rely on converting natural ecosystems in monoculture plots lacking in biodiversity and will not suffice. Alternative farming practices have popped up globally to address this issue. This includes practices such as conservation agriculture, permaculture, restoration agriculture, sustainable agriculture, and numerous offshoots—with the overall goal of these techniques being to promote biodiversity whilst producing food. This poster will focus on exploring these farming practices and evaluating their validity in promoting biodiversity. By comparing, data on ecosystem health and biodiversity in conventional agricultural plots with these new or reclaimed methods, one can determine what approaches are most effective. Since agriculture receives heavy government influence, the poster will also seek to understand how government policy can influence the implementation of sustainable agriculture. Overall, the poster aims to discuss ways in which a community can produce food without needing to destroy a native ecosystem.

6. **If the Agro is Urban, You Know You're Conservin'**

*Presenters*
Laura Kelley, Kobi Eng

*Departments*
Biology, Environmental Sustainability

*Keywords*
Sustainable Urban Agriculture; Food Deserts

Conventional agricultural techniques have rendered many communities bereft of access to healthful food. By exploiting habitats in ways that reduce biodiversity in ecosystems, they create urban food deserts. Food deserts are defined by the USDA as areas in the US without healthful fruits and vegetables. The task of decreasing urban food deserts is therefore inherently connected with protecting biodiversity through preservation and conservation. The significance of sustainable urban agriculture lies in the intrinsic value of biodiversity and the importance of providing everyone with a reasonable standard of living. Human food production can destroy or protect ecosystems, posing respective impacts on human life and wellbeing. There are many ways to accomplish sustainable urban agriculture. Examples of effective practices include hydroponics, vertical farming, community gardens, edible landscapes, and cultivating diverse products. Sustainable urban agriculture depends on goal fulfillment. The intended benefits of these practices regard empowering marginalized and systematically disadvantaged groups to have greater autonomy, local food security, and economic equity. These implications are inextricably tied to reducing crops’ disease susceptibility, reducing habitat loss from land-use, and reducing ecological footprints from transportation. Embarking on sustainable urban agricultural projects is something anyone can do to lift up their social and biological communities.
7. Sustainable Forestry: A Powerful Defense Against Climate Change

*Presenters*
Georgia Tillotson, Annie McClung

*Department*
Biology

*Keywords*
Climate Change; Adaptive Forestry; Ecosystem Services

All across the globe, forests are being degraded and destroyed as a result of human activity. Deforestation disrupts vital ecosystem services essential for maintaining life on earth, including processes that help to mitigate the effects of climate change. Carbon capture and sequestration by forests reduces concentrations of atmospheric CO2, and cooling provided by evapotranspiration has a net cooling effect on surrounding surface air temperatures and contributes to the maintenance of global temps. In this poster, we describe the ill-effects of deforestation on global climate, and explore potential solutions to the issue of forest degradation and destruction. We will examine initiatives for the prevention of further forest loss, as well as reforestation initiatives. Additionally, we will investigate adaptive modes of forest conservation focused on creating more resistant and resilient forests, and using well-managed forests as a tool to efficiently reduce the effect of global climate change.

8. Save the Blue Bloods

*Presenters*
Abigail Armstrong, Anna Mullin

*Department*
Biology

*Keywords*
Horseshoe Crabs; Bleeding; Conservation

Horseshoe crabs (Limulidae) are marine arthropods that are commonly found in shallow coastal waters. Often identified as keystone species in their habitats, these animals play a vital role in the ecosystem. Beyond this, however, horseshoe crabs are of vital use to the medical industry. Relatively recently, the rare blue blood of the horseshoe crab was found to be capable of identifying bacteria and toxins in medical applications. Since this discovery, demand for horseshoe crabs has skyrocketed, and increasing numbers are harvested to be bled. While crabs are returned to the wild after the procedure, their populations are declining, and the effect which has been strongly linked with the negative impacts of bleeding practices. In this poster, we explore the ways in which this detrimental effect on the horseshoe crab population can be minimized in order to conserve a medically and ecologically valuable species. We investigate the ways in which declining horseshoe crab populations affect other populations (such as migratory shorebirds), the economic drivers of the horseshoe crab blood market, and possible restorative options such as captive re-breeding populations, education-based conservation efforts, responsible bleeding practices, and man-made Limulidae blood alternatives. We suggest options for actions that can be taken at both the local and global level to minimize the impact of bleeding.
9. **Effects of Lonicera maackii on Soil Nutrients, Species Composition, and Seed Germination**

*Presenters*
Jordan Lehman, Claire Rickerman, Megan Howell, Paolo Rossi

*Department*
Biology

*Keywords*
Honeysuckle; Soil; Seed Germination; Species Composition

Non-native species of honeysuckle have become invasive throughout the United States and have been decimating the populations which previously occupied those areas. At Earlham, honeysuckle has invaded on our back-campus woods. However, since October 2004 there have been plots where it has continuously been removed. We are asking three major questions regarding this removal: 1) Will honeysuckle removal impact the nutrient load in soil? 2) Does the presence of honeysuckle or the removal of honeysuckle impact the species distribution of surrounding understory plants and bushes? 3) Does honeysuckle infestation have an impact on seed germination? In order to explore these questions, we are running soil tests, looking at species composition, and doing a greenhouse based experiment comparing seed germination in honeysuckle removal plots to non-removal plots back campus. These experiments are currently still in progress but we are thrilled to announce our results at the EPIC Expo! These results will build upon previous student research on the honeysuckle removal plots back-campus and provide further insight into how invasive species, such as honeysuckle, impact forest ecology.

10. **Are Ex-situ Conservation Strategies Effective for Conservation**

*Presenters*
Kyra Joseph, Camille Van der Vaart

*Department*
Biology

*Keywords*
Conservation; Ex-situ; Biodiversity; Solution

There are many strategies that conservationists are adopting to ensure that biodiversity in the world is maintained. Unfortunately, so many species within various biological communities are going extinct in their own populations because of overall human disturbance and even counterintuitive strategies used to conserve them are having a bad effect on these dying populations. These methods include methods such as in-situ conservation, or taking specific approaches like prioritizing whole ecosystems, or just conserving certain areas. Although not all methods and strategies of conservation are bad, in fact most conservation approaches have both a lot of pro’s, as well as con’s to them. One such conservation method that we will be focusing on is ex-situ conservation. Ex situ conservation is the preservation and propagation of species and populations, their current population and future offspring, outside of the natural habitat where they occur in. We will discuss the exploration of ex situ and its overall effects on populations as it is affecting many aspects of biodiversity to turn out either very successful or detrimental.
11. **Save Yourself, Eat Plants**

*Presenter*
Gabriela Corrales

*Department*
Biology

*Keywords*
Climate Change; Dietary Changes; Greenhouse Emissions; Vegetarianism/Veganism

Although the main focus of climate policy has been to reduce fossil fuel consumption, large cuts in CO2 emissions alone will not abate climate change (Ripple et al. 2013). There are large amounts of non-CO2 emissions contributing to direct radiative forcing as well. Notably, greenhouse gas emissions from ruminant meat production are significant (Ripple et al. 2013). Among the greenhouse gases, methane (CH4) is considered to be the largest potential contributor to the global warming phenomenon (Naqvi and Sejian 2011). Specifically, ruminant livestock such as cattle, buffalo, sheep and goats contribute the major proportion of total agricultural emission of methane (Naqvi and Sejian 2011). Reductions in global ruminant numbers could make a substantial contribution to climate change mitigation goals and yield important social and environmental co-benefits (Ripple et al. 2013). In this poster, I will discuss how potential solutions and their effectiveness to tackle on this problem such as transitioning to more plant-based diets.

12. **Let the Cat Out of the Bag? Don’t.**

*Presenters*
Emma Stinson, Emma Stofferahn

*Department*
Biology

*Keywords*
Cats; Native Species; Invasive Species

Cats are one of the most popular pets in the world and have become one of the worst invasive species when they are left outdoors or become feral. Cats are predators and will hunt, even if they are well-fed. Domestic cats (Felis catus) pose a significant problem to many native species because they predate at high rates and have no natural predators in most areas. In the United States alone they are estimated to kill around one billion birds a year (Dauphiné and Cooper, 2009). Domestic cats also pose a threat for an estimated 22 million mammals yearly as well as threatening numerous reptiles (Loss and Mara, 2013). This predation represents a significant loss of biodiversity, increased effects on native predators, and increased disease rates. Like many other conservation issues, the solutions that we see are multifaceted. Our poster will investigate potential solutions including keeping cats indoors, putting bells on cats, trap-neuter-release programs for small feral populations, and trap-euthanize programs for large feral populations. We will discuss the implications of each of these approaches. If we carry out some or all of these solutions, we will be able to increase biodiversity through conservation while allowing people to enjoy the species that exist naturally within their ecosystems (Belaire et al. 2015).
13. **Arsenic in Private Groundwater Wells and Harmful Algal Blooms internship with the Indiana Department of Environmental Management**

*Presenter*
Nate Krautheim

*Department*
Geology

*Keywords*
Arsenic; HABS; Contamination; Private Groundwater Wells

During the summer of 2018 I worked for the Indiana Department of Environmental Management (IDEM). There I participated in 2 projects one called Harmful Algal Blooms (HABS) and another unnamed one about Arsenic. The main project was the Arsenic project. The goal was to determine radiant Arsenic contamination levels in private groundwater wells in the state of Indiana. The goal was once information had been collected, the State could recommend which areas of the state could need special treatment. The HABS project was done every two weeks at two specific sites and was to monitor and determine Blue-Green Algae levels in intake water at water treatment plants.

14. **Energy-aware Management System on Cluster**

*Presenter*
Thuy Thai

*Department*
Computer Science

*Keywords*
Computer Science; Energy; Cluster Computing Systems

This research is in pursuit of energy-efficient workload management strategies for cluster computing systems. In this research, we focused on both the development and optimization of a web-based cluster monitoring system and the conduction of experiments which utilize the monitoring system for data collection and analysis. We improved the monitoring system by adding a task manager for archiving data, and enabling online data comparison of experiments that were conducted at various time periods on different cluster nodes. We designed and conducted experiments with two types of CPU-intensive workloads, then we built models for energy consumption according to CPU utilization and validated the models. Our experimental results showed that the models we built had high accuracy in predicting the energy consumption of our cluster system. Furthermore, we conduct experiments by utilizing different load balancing strategies to better understand how different workload distributions affect energy use and heat generation in the cluster system.
15. Combining Inadmissible Heuristics with a Neural Network

Presenter
Herschel Darko

Keywords
Neural Network; Sliding-Tile Puzzle; AI; Heuristics; Deep Learning

Heuristic search algorithms are a common technique seen in AI, especially for path-finding and automated planning. Such algorithms often use an admissible heuristic to guarantee optimal solutions to real-world problems, but memory and time limitations can render this method infeasible for a number of these problems. A useful alternative is to let these algorithms use inadmissible heuristics instead, resulting in sub-optimal yet practical solutions. This alternative poses the question of which heuristic would produce the solution closest to being optimal while remaining practical for a specific problem. This work proposes an answer: Use multiple inadmissible heuristics as features of a neural network. This combines the strengths of the individual heuristics via the neural network and results in actions that the AI should perform. This procedure will be tested with the 11-sliding tile puzzle problem, a variant of the more common 15-sliding tile puzzle problem seen in heuristic research.

16. Lip Reading using Neural Network and Deep Learning

Presenter
Karan Shrestha

Keywords
Lip Reading; Deep Learning; Neural Network; Web Application; Data Preprocessing

The task of lip reading is a challenge. It requires both knowledge of and familiarity with the underlying language along with understanding visual clues from the speakers to predict the words. The work of predicting spoken words becomes difficult as people use different dictions and ways of articulation in their speech. With the help of deep learning, lip reading has been automated to produce a significant result. In this project, I have trained a deep learning model - Convolutional Neural Networks - to predict the words. The dataset used in training the model comprises thousands of sentences spoken in BBC television. The scope of this project extends for user experience by integrating the trained model in a web application for real-time speech recognition.
17. **Music Recommendation System Using Collaborative Filtering**

*Presenter*
Vuong Khuat

*Keywords*
Recommender Systems; Collaborative Filtering; Recommendation Algorithms; Machine Learning

With the increasing popularity of music streaming, music recommender systems are important instruments for increasing digital music consumption. However, collaborative filtering, a technique widely used in recommender systems, is not generally adapted in this domain due to the fact that the technique does not scale well with large amounts of data. This work proposes an implementation of a recommender system using collaborative filtering with optimizations to address the efficiency problem.


*Presenter*
Daiki Akiyoshi

*Keywords*
Stock Prediction; Machine Learning; Artificial Neural Network (ANN); Support Vector Machine (SVM)

Stock market prediction and developing profitable trading strategies have always attracted businesses and academia, and many studies have been conducted in the field to solve the puzzle of stock markets. Some prediction methods use machine learning, which involves processing a vast amount of information that might affect stock markets. Previous studies demonstrated high accuracy in predicting directional movements of stock prices. However, achieving high directional accuracy does not directly translate into great profits, as this ignores the magnitude of stock price fluctuations. There have been studies that address this limitation by predicting stock prices themselves instead of just directional movements. However, studies vary in the evaluation metrics they use, and thus it becomes problematic to compare them effectively. To address this limitation, this study evaluated predictive models based on three metrics: directional accuracy, closeness, and profit generated by trading simulation. I believe that using these three metrics will help me effectively compare machine learning algorithms and determine whether they can be used in predicting stock prices in a real setting.

19. **ELO Algorithm vs Reddit Hot Rank**

*Presenter*
Priscilla Coronado

*Keywords*
Algorithms; Database; Datascience

This is a study on two sorting algorithms - ELO and Reddit's Hot rank - to see how quickly they are able to sort a table of around fifty thousand inputs.
20. Using Heart Rate and Body Movement Data to Determine the Optimal Wake-up Time

Presenter
Giorgi Kharshiladze

Keywords
Sleep Pattern Classification; Supervised Machine Learning; Optimal Wake-up Time

As students, we often have trouble in time management. It is hard to maintain the balance between our social life, deadlines, sleep, etc. Therefore, since sleep is one of the most important aspects of our life, I decided to use different types of machine learning algorithms to classify the sleeping stages and predict the optimal wake-up time based on the heart-rate and body movement data. To collect the labeled data, I used the Fitbit alpha HR wearable device which allows us to access the data online through their WEB API. Using supervised learning, we came up with an accurate way to determine the wake-up time and be more energized throughout the day. The best thing about this algorithm, as well as all machine learning algorithms, more data we collect, smarter and more accurate they become.

21. An Artistic Data Visualization Of Pollution at Earlham College

Presenter
Sara Salloum

Keywords
Data Visualization; Pollution; Aesthetics

The importance of data visualizations in the modern times cannot be denied, and their use is significantly increasing. However, there seems to be little interest in the aesthetics of what can be done with data, and we only seem to focus on getting information out of it. On another note, air pollution has been a concern for our health for a long time, yet there is little being done to change that. This project will propose a tool which collects air pollution data on the campus of Earlham college and create an artistic visualization of it. An Arduino device will be used to collect data on air quality through measuring the concentrations of specific pollutants in different locations on campus. The data will then be used to create a Mondrian-style visualization.

22. Comparing Common Approaches to Image Mergin

Presenter
Daniel Stoffregen

Keywords
SIFT SURF SFM Computer Vision

This paper will compare the benefits of different computer vision algorithms when used to create orthophotos, aerial photos corrected for geography that are a combination of images. Reliable orthophotos create opportunities for small teams with limited budgets to perform studies on large areas. This project was born from a need to use orthophotos for volumetric analysis of glaciers and measure the growth and expansion of lupine in eastern Iceland. The algorithms are Scale Invariant Feature Transformation, Speed up Robust Features, and Structure from Motion. This paper will compare the number of keypoints found by each approach, and compare the time each takes to run on the same data.
23. **3D-Quantify: A workflow for generating Volume of an object using 2D images and Structure from Motion**

*Presenter*
Ahsan Ali Khoja

*Keywords*
Structure from Motion; Multi-view Stereo Reconstruction; UAV; Volume Calculation

Volume calculations and survey methods are needed to detect changes in the flow of glaciers over time and to calculate the capacity of gullies. The current solutions are either labor-intensive, expensive, or both, making the process inefficient. This paper provides a solution called 3D-Quantify, a framework for volumetric calculations of 3D models generated using Structure from Motion (SfM). SfM is a cost-effective method for reconstructing a 3D model of an area by stitching 2D images. These models can then be scaled to extract features, including the volumetric measure and capacity of the area. This project explores existing solutions for the individual components, focusing on the volume calculation algorithm for refinement. This algorithm is tested for multiple sites, with data from our approach compared to volumetric data (i) measured using manual calculations and estimations, and (ii) calculated using existing volumetric measurement software. We have examined the cost of equipment, prior experience required to use the workflow, and human time and input needed for the workflow to function.

24. **Database Indexing: Time Series Simulation Comparing X-tree and Inverted Index**

*Presenter*
Shana Weissman

*Keywords*
Time Series; Indexing; X tree; Inverted Index; Simulation

It is common knowledge that databases exist and power important research along with such things as the web and other widely used tools. It is less known that a database’s driving force is it’s index. The index has the functionality of any regular index; it is used to find the location of a specific item or value in a pool of information. In this case the dataset is what is indexed and it is used to find specific values. Indexes are complex structures with many variations each having their strengths and weaknesses. This applies to the subset of indexes used for every type of data, for example text data, relational data, etc. This paper describes a comparison via simulation, SIM_TSDB, of two specific index structures used for time series data. The two indexes are the X-tree and the Inverted Index. SIM_TSDB, written in Python, tests the speed of finding a value’s location through the index. It does not interact whatsoever with an actual time series database. The results answer the question, which of the two indexes should be used depending on what is being done with time series data and the volume of it.
25. **Visualizing the Nonvisual: Screen Readers & Data Visualization**

*Presenter*
Flannery Currin

*Department*
Computer Science

*Keywords*
Accessibility; Screen Readers; Data Visualization

As “big data” has become a more prevalent factor in decision making, people have grown increasingly reliant on data visualizations to quickly grasp major trends and takeaways at a glance. However, this content is largely inaccessible to blind and visually impaired web users who navigate the internet using screen readers. Screen readers present information auditorily, which means everything must be presented linearly, which is not conducive to interpreting data visualizations as they exist now. My capstone project seeks to explore some of these accessibility issues and create a tool that might help web developers understand and address them.

26. **Fake News Detection with Sentiment Analysis and Metadata**

*Presenter*
Maniz Shrestha

*Department*
Computer Science

*Keywords*
Machine Learning

Fake news is any form of false story or content spread on the internet to influence people's view to gain inimical benefits. Detecting fake news in the digital world has been a significant challenge in overcoming the widespread dissemination of false rumors and biases. Although there has been significant progress in fake news detection, a standard set of solutions is yet to be established. Companies such as Facebook, Twitter and Google are facing challenges in tackling this problem to ensure a platform where people can trust the newsfeed content. This study used a hybrid approach of combining sentiment analysis with the network approach of using metadata to create a fake news classification model. A user-friendly web interface was implemented to enable users to easily query a news source using a URL and determine whether the news is fake.
27. **Political News Bias Detection using Machine Learning**

**Presenter**  
Minh Vu

**Department**  
Computer Science

**Keywords**  
Machine Learning; Neural Network; Natural Language; Processing; Multi-Layer Perceptron; Political Bias

The political climate in the U.S. is sharply divided into two major ideologies: liberal and conservative. In the era of massive social media usage, such ideologies are disseminated at an unprecedented rate. People with certain political opinions get fed information supporting the same political viewpoints, creating an ideological bubble that hinders them from a subjective, neutral information environment1. This study aims to use Multilayer Perceptron (MLP), a new, promising neural network used in Natural Language Processing (NLP), to solve the current problem of political bias detection, contributing to the existing body of works that use neural networks to detect political ideologies. It also implements an application (a Google Chrome extension) which can utilize such framework to perform real-time political ideologies classification.

28. **Detecting Textual Analogies Using Semi-Supervised Learning**

**Presenter**  
Rei Rembeci

**Department**  
Computer Science

**Keywords**  
Analogy; Natural Language Processing; Semi-Supervised Learning

Semi-supervised learning is a family of techniques in machine learning, which has seen a growth in interest due to the fact it requires less human effort and can provide better accuracy compared to other machine learning techniques. Analogy is an essential aspect of human communication, understanding, and knowledge sharing. However, strategies for detecting textual analogies using machines are largely unexplored. There is also no standard corpus of textual analogies. This paper presents a system for detecting analogies in a given text using two semi-supervised learning techniques; transductive support vector machines (TSVMs) and label propagation. Count vectorization, tf-idf, and hash vectorization are the explored feature extraction tools. The Brown corpus is divided into three parts: unlabeled data used for training the classifier, manually labeled data used for training the classifier, and manually labeled data used for testing the classifier. The accuracy of the classifications, confusion matrices, as well as the f-scores, are used to evaluate the performance of the system.
29. **A Self-service Library Management System Using RFID**  
*Presenter*  
Ali Shahram Musavi  
*Keywords*  
Library Management System; Self-service; RFID  
This paper discusses the design and implementation of a self-service library management system using Radio Frequency Technology. RFID is a combination of radio frequency-based technology and microchip technology. It is slated to replace barcodes in library applications to provide a faster and more efficient way to track, locate and manage library materials. The self-service system will be placed at Hopper lab in the Center for Science and Technology. Currently, there is no resource management system in place, and students and faculty in the department have a difficult time managing devices. The self-service system uses UHF RFID reader and tags and is designed to improve student access to the lab as well as making inventory and tracking easier for the Computer Science department. This paper introduces the different components of the system, design plan, implementation, and testing.

30. **SonoSpatial Walk: 3D Sound Spatializer in MaxMSP using Jitter**  
*Presenter*  
Justin Kerobo  
*Keywords*  
MIDI; OpenGL; MaxMSP; HOA Library; Jitter  
A musician, artist, composer, or even scientist has many needs when it comes to the sound space, which is one of the first dimensions of the contemporary musical and sonal thought. There are many ways to affect the virtual sonal environment with hardware and software. Of the various tools in the electroacoustical domain, this focuses on spatialization. Using this, an artist can create new music, a composer can change sound directly, and a musician can edit their sound in real-time. HOA Library is one of the tools that has allowed for musicians and composers to synthesize, transform and render sound spaces in a creative and artistic way. However, due to various other open-source spatialization tools, HOA Library is widely overlooked. Therefore, I developed "SonoSpatial Walk," a 3D audio sequencer that uses MIDI and HOA Library that is dependent on nothing but open-source, cross-platform libraries.

31. **ColorSynth: An Audiovisual Tool for Understanding Harmonic Ratios**  
*Presenter*  
Ethan Rountree  
*Keywords*  
Music Visualization; Musical Harmony; Graphics Matrices  
This project is an experiment in visualizing musical harmony. Notes are represented using color and spatial mapping in graphics matrices. The visualization is designed to represent the harmonic relationship between two simultaneous played notes from a MIDI keyboard.
32. **Using Gesture Recognition to Navigate Google Chrome**  
*Presenter*  
Yuki Adams  
*Keywords*  
Gesture Recognition; Computer Vision; Supervised Machine Learning

When people communicate with each other, they often use hand gestures to facilitate their conversation. When people interact with computers, they use keyboards, touchscreens, and mouses to convey their messages. In this project, a user can perform various hand gestures in front of their laptop or desktop camera to move throughout Google Chrome. This gesture recognition system allows users to scroll, zoom, and move forward or backwards a page on the browser.

33. **Gerrymandering and Graph Partitioning: Approaches to Population Division Models**  
*Presenter*  
Chau Pham  
*Department*  
Computer Science  
*Keywords*  
Gerrymandering; Population Modeling; Graph Partitioning; Compactness; Redistricting

Gerrymandering is the practice where voting district lines in a state are drawn to benefit one party over another. To combat this practice, computer-generated districting plans can be utilized. One way to generate districting plans is to treat the geographical area like a graph and model its population attributes, then divide up the area according to these attributes. In this project, a graph partitioning algorithm is created to generate compact electoral districts in several states. The algorithm generates several districting plans, then finds the most compact ones by evaluating several attributes measuring how spread out the population is in each district. The best districting schemes are then visualized using a mapping tool.

34. **Crawl-O-Matic-O-Matic: Automated Optimization of AI**  
*Presenter*  
Eli Ramthun  
*Department*  
Computer Science  
*Keywords*  
Roguelikes; Machine Learning; Artificial Intelligence; Software Optimization; Expert Systems

This project involves utilizing machine learning techniques to attempt to optimize an already existing artificial intelligence (AI) agent that plays the roguelike game Dungeon Crawl Stone Soup (DCSS). Roguelike games feature high levels of randomization and are notoriously difficult - 0.73% of DCSS games played online are winning games. An AI agent has been developed that is capable of winning a game of DCSS without human assistance. This project aims to utilize machine learning to automatically tune the agent to improve its performance for a certain portion of the game.
35. **Feasibility Study of the Usage of Blockchain Technology in Online Privacy Protection**

*Presenter*
Benjamin Folk-Sullivan

*Department*
Computer Science

*Keywords*
Blockchain; Privacy Protection; Browser Cookies

In the modern day, a lot of private information people want to protect can easily find its way onto the internet. Blockchain Technology is a computer design architecture created to keep information secure and immutable. To find a way to better protect private information, this study explored the feasibility of using a blockchain system to protect online privacy. This study focuses on regulating access to browser cookies by online web-servers. Before a web-server can access a cookie, a blockchain network will authenticate the web-server's permissions. Request Latency and Request Scale change with the number of nodes in the blockchain network will be used to determine this set-up's feasibility.

36. **Kenlee Ray Library and Archives Fellows – Exploring Career Opportunities**

*Facilitator*
Amy Bryant

*Presenters*
Anh Nguyen, Leanne (Le Zhi) Cheong, Tori (Victoria) Trezona, Yasmin Dasilva

*Department*
Library

*Keywords*
Libraries; Archives; Fellowship; Career Exploration

The Kenlee Ray Fellows program provides an opportunity for students to learn more about potential careers in libraries and archives. Students undertake project work, meet with library personnel, and discuss readings under the supervision of Earlham Libraries administrative faculty. They also network with Earlham LIS alumni and visit area libraries. The 2019 Fellows will share information about their experiences.

37. **Writing Grants for the Iceland Research Project**

*Presenter*
Kyle Barbour

*Department*
Global Management

*Keywords*
Grants; National Science Foundation; Iceland

This research project focuses on the process of grant writing for the Iceland Research Project. The Iceland Research Project (IRP) uses multidisciplinary approaches, such as computer science, geology, biology, and archeology, ecology, and physics, to discover how Icelandic civilization lived in the past. Through using software platforms, collecting soil and leaf samples from Iceland and Nicaragua, then processing the samples in a lab for sequencing, analyzing the sequencer output, and visualizing the results. However, grant funding is needed to accomplish the goals for the IRP. In doing grant research, there were many phone calls, meetings, proofreading, writing, and rewriting grant to the National Science Foundation, National Geographic Foundation, Grants.gov, Fulbright Program, Land Rover & Royal Geographical Society. Though the results ended in not receiving funds, due to deadlines and international grant rules, there are future plans to writing and submitting grants to obtain more funds to further IRP research.

38. **An Icelandic Glacier in the Anthropocene: The Story of Sólheimajökull**
Glaciers around the world are retreating at an accelerating rate as a result of climate change. As the ice melts and exposes more land, bacterial populations in the soil change in response to their new environment. We explore the evolution of the microbial population at the Mýrdalsjökull glacial offshoot Sólheimajökull in southern Iceland using 16S rRNA analysis. We use historical data, GIS models, and in-field lichenometry to assign date ranges for each sample spot in the forefield. We characterize how the glacier and underlying microbial population have evolved over the past 100 years.


Presenters
Charles Peck, Ahsan Khoja, Rei Rembeci, Dan Stoffregen

Department
Computer Science

Keywords
Viking Archeology; Iceland

The reduction in size and cost-of-entry for systems such as remote piloted unmanned aerial vehicles (UAV) and laser scanners has seen the field of applied computer science spill over into new territories. Our research seeks to develop an open platform and infrastructure capable of achieving high-resolution results without high costs. The infrastructure supports interchangeable sensor modules which mount to the UAV. Once collected, the georeferenced data streams are analyzed and visualized using a mix of locally developed and open source software. To-date, we have applied these techniques working with ecologists, archeologists, and glaciologists in Iceland with the most progress being made in the context of Viking archeology.

40. Shetland Knitting Traditions

Facilitator
Callie Maidhof

Presenters
Elena Banafshe Johnson, Kate Buche-Pattison, Eva Newman-Coley, Rowan Augusta Clare Hellwich, Mia Kaplan, Hannah Maelyn Lewis, Eliza Balch, Rebecca Haflich

Departments
Art, Sociology and Anthropology

Keywords
Knitting; Fiber Arts; Shetland; UK; EPIC

Students from the 2018 Shetland Knitting Traditions EPIC Advantage trip will share their knitted projects.
41. **Medical Humanities Integrated Pathway**  
*Presenters*  
Eleanor Batista-Malat, Carley Carpenter, Ramiro Flores Díaz  
*Department*  
Medical Humanities  
*Keywords*  
Medical Humanities; Bioethics; Interdisciplinary  
This poster covers the background of Medical Humanities and how it is used today. It is the cumulative project for one half of the first group of Medical Humanities Integrated Pathways students.

42-45. **Bonner Scholars Poster Presentation**  
*Presenters*  
Eleanor Batista-Malat, Ethan Rountree, Joe Ryan, Jim Bowie  
*Department*  
Bonner Scholars  
*Keywords*  
Bonner Scholars; Service Learning; Senior Capstone  
Earlham College’s senior Bonner Scholars share their senior capstone. Bonner Scholars serve with dozens of non-profits in Richmond and their home communities. Through their work, they help the local community and gain leadership skills. This capstone is a reflection on their past four years and what lasting legacy they hope to leave behind at their service site.

46. **Student Activism Support System**  
*Presenters*  
James Bowie, Nicole Aleksandra Gruszka; George Morpurgo; Arden Ambrose  
*Department*  
Interdepartmental  
*Keywords*  
SASS; Campus Activism; Social Justice; Campus Resources; Community Outreach  
We believe that student activism plays a crucial role in the development of a civically-engaged and justice-driven community. Successful student activism requires effective communication between activist groups, the general student population, and the broader community. Towards this end, we are in the process of planning and growing a network and public workspace for the explicit purpose of connecting Earlhamites with tools for activism on campus and in the community called the Student Activism Support System (SASS). The SASS will be an invaluable tool for ongoing efforts to make our campus a more engaged and just place.
47. Activism and Sustainability at Earlham College

Presenters
Madison Dalzell, Hannah Fussell, Katherine Hill

Department
Interdepartmental

Keywords
Sustainability; Activism; Less Waste; Metz

This presentation is about the sustainability project from Sophia Lombardo's "Student Social Action" class. The projects focused on environmental issues within the Earlham community, especially within food service, and how students can unite to meet these problems.

48. International Youth and Student Movement to the United Nations

Presenter
Caitlin Corrigan-Orosco

Departments
International Studies, Politics

Keywords
Informational Poster Presentation on ISMUN Program

The International Youth and Student Movement to the United Nations (ISMUN) works with students and young people - (a) to promote: national liberation; economic, social and cultural justice; peace and disarmament; human rights; (b) to oppose: colonialism; imperialism; neocolonialism; repression in all forms. This movement works to promote an informed public and wider knowledge of the United Nations and its actual meaning and potentialities; as well as to encourage a critical attitude towards the UN to promote its universality and effectiveness. Caitlin Corrigan-Orosco was invited to participate in The 2018 ISMUN Summer School on Human Rights and Development, to learn about the UN Human Rights system. The program focused on the right to development, as well as social and economic rights, and it includes lectures given by academics specialised in human rights, UN Special Rapporteurs, experts on the Human Rights Council and treaty bodies, UN officials, diplomats and NGO representatives working on key issues.
49. Role of Perineuronal Nets in Reducing Memory Interference in Mice

Presenters
Mallory Crosby, Abhay Chaudhary

Department
Neuroscience

Keywords
Neuroscience; Perineuronal Nets (PNNs); Olfactory Learning; Memory

Perineuronal networks are extracellular structures involved in the formation of long term memory and the closing of critical periods in development. They may also be involved in decreasing the retrieval time for similar memories, thereby, reducing memory interference. In this experiment, we tested whether perineuronal nets (PNNs) are necessary for reducing memory interference. To do this, we trained mice on an olfactory perceptual learning task with three phases: pre-test, enrichment, and post-test. In the pre-test, we tested the mice’s native ability to discriminate between two highly similar odors. Immediately after the pre-test, half of the mice were infused with Chondroitinase ABC, an enzyme that degrades PNNs, and the other half infused with a vehicle. During the following enrichment phase, half the mice from either infusion groups were exposed to +/- limonene and the other half were exposed to mineral oil for a period of fourteen days for 1 hour a day. We expected that the mice with degraded PNNs and exposure to +/- limonene would not be able to discriminate between the two odors during the post-test. The experiment yielded inconclusive results which could be attributed to the low sample size and added variance caused by different mice handling methods.

50. Anthrozoology Integrated Pathway Culminating Experience

Presenter
Molly Rannebarger

Departments
Psychology, Biology, Anthrozoology

Keywords
Anthrozoology; Biology; Museum Studies; Human-Animal Interactions

I will be presenting on which classes I took to complete the IP, and the related co-curricular activities I participated in. I will also discuss themes and lessons related to human-animal interactions that cut across these experiences for me. Finally, I will articulate how I believe the IP has influenced my future plans.

51. Anthrozoology Integrated Pathway

Presenter
Audrey Brunt

Departments
Psychology, Sociology and Anthropology, Biology, Anthrozoology

Keywords
Human-Animal Interaction; Zoo; Anthropology

My presentation is the culminating experience of my Anthrozoology IP so it will focus on bringing together all of my class and non-class experiences. From campus to the Philadelphia Zoo this Integrated Pathway has given me many new experiences and I am excited to share the results of them.
52. Anthrozoology Integrated Pathway Culminating Experience  
*Presenter*  
Anna Carlson  
*Departments*  
Psychology, Biology, Anthrozoology  
*Keywords*  
Anthrozoology; Biology; Human-Animal Interactions; Environmental Education  
I will be presenting on the classes I have taken and the co-curricular activity I have taken and done to complete this IP. I will talk about the themes that stretch across these multiple experiences and how they will contribute to my future plans.

53-57. Research Presentations from ENSU 210 “Outdoor and Environmental Education”  
*Facilitator*  
Jay Roberts  
*Department*  
Environmental Sustainability  
*Keywords*  
Outdoor and Environmental Education  
The following poster presentations are the result of student research in the ENSU 210 Outdoor and Environmental Education spring semester course.

53. Ambassador Animals: Do live animal interactions improve the educational experience?  
*Presenter*  
Anna Carlson

54. Last March of The Ents: Re-Wilding and Eco-Restoration  
*Presenter*  
Kian Eckert

55. Let’s Take a Hike Girlfriend: a closer look at wilderness therapy in at-risk girls  
*Presenter*  
Ocklawaha Holt

56. Is The Earth Becoming A Jurassic Park?  
*Presenter*  
Meghna Subramaniam

57. The Impact of Wilderness Therapy on Long-Term Substance Abuse Recovery  
*Presenter*  
Avery Salerno

Wednesday, April 17  
Session D
11:00 a.m. – 12:15 p.m.

D.1 Digital Exhibit: Earlham College & Japanese Americans 1942-1945
↔ Location: Main Floor of Lilly Library

Facilitators
Amy Bryant, Jenny Freed

Department
Library

Keywords
Library Archive; History; Japanese Americans

View the new touchscreen digital exhibit about the history of Earlham College and Japanese American students during World War II. Associate Library Director Amy Bryant and College Archivist Jenny Freed will be available to talk about the history of the project and the creation of the display, which involved alumni donations and the help of over 17 student workers.

D.2 Language “Tasting” Event
↔ Location: LBC 124

Facilitator
Candice Marshall

Presenters
Rebecca Belcher, Kaela Cassady, Aidan (Ari) Schrier, Elijah Owens

Department
Comparative Languages and Linguistics

Keywords
Interactive; Language; Learning

Presented by the students in CLL 344: Studies in Language Learning and Teaching, join us for interactive mini-lessons, or samplings of various languages. Attendees will rotate between the stations to fully experience each language presented. Presenters will also have handouts available to help you remember the key takeaways.
D.3 Discussions on the Local Community  
Location: CST 103

D.3.1 Richmond - A Bonner Perspective

Presenters  
Kevin Whited-Ford, Rachel Sames, Blanca Ortiz

Department  
Bonner Scholars

Keywords  
Bonner, Service, Community

A Bonner Panel on the Richmond community presenting the differing perspectives attained by Bonner Scholars throughout their service experiences. Bonner Scholars will share stories of the service they have completed and how these experiences have informed their understanding of the people, places, and politics of Richmond.

D.3.2 Toward Food Justice: A Report from the Zero Hunger Class Project

Facilitators  
Jonathan Diskin, Jana Schroeder

Presenters  
Alexis Warren, Evan Feldberg-Bannatyne, Kobi Eng, Sudeep Lama

Department  
EPIC Zero Hunger Course

Keywords  
Food; Hunger; Justice; Local Engagement

According to the US Agriculture Department, over 20% of the children in Wayne County Indiana lived in food insecure households in 2016. This panel will focus on understanding and addressing this chronic social and human problem in our locality. The presenters are students in a 1 credit EPIC course called “Zero Hunger” that centered on gaining some broad historical, policy, and empirical perspective on hunger issues in the United States as a foundation for local engagement that was part of this course. We will provide some background on food insecurity and then turn to the work of the Wayne Country Food Council, with whom we have been collaborating. We will consider some short run and longer run forms of action and local partnerships that seem to us to be promising modes of participation for Earlhamites in the future. We will also reflect on the nature of community based research and collaboration as this is intended to be the beginning of ongoing engagement in our local community on this and other issues that affect the quality of life here.
D.4  ENSU Senior Capstone: Prairie Possibilities! Improving ecological and financial sustainability through native plantings on Earlham’s campus
Location: CST 300

Presenters
Brenna Hellman, Lydia Evans, Evelyn Barragan

Departments
Environmental Sustainability

Keywords
Prairies; Sustainability; Environment; Campus Improvement

This is the senior capstone project of the Environmental Studies, Sustainability, and Science seniors. We have been partnering with the Earlham Facilities Department to increase native landscaping on Earlham’s Campus. Our proposal involves turning several Earlham lawns into self-sustaining prairie ecosystems. Not only would this significantly reduce landscape maintenance costs, it would also create habitat for wildlife, increase carbon sequestration, and create educational and recreational opportunities for the Earlham and Richmond communities. This plan will be presented to the Board of Trustees in June, and we welcome anyone on campus to share their input and ideas for the project. Following the presentation, there will be time for questions, comments, and open dialogue. We are excited to share the possibilities prairies have to offer the Earlham community!

D.5  Student Research in the Earlham Art Collection
Location: Richmond Room in LBC

Facilitator
Lyn Koehnline

Presenters
Eila Munro Ahoner, Arya Rama

Departments
Art, Chemistry

Keywords
Masks; Art and Science

Students will discuss the exhibits they have curated from the Earlham Art Collection for the display cases on the first floor of LBC. Arya Rama will present her findings about our collection of masks from all over the world. Eila Ahoner will present the chemical analytical work she has done on a selection of paintings and of metal artifacts.
D.6 **The Crucible: Spring 2019 Issue Launch**  
Location: Carpenter 211  

*Facilitator*  
Tessa Yang  

*Presenters*  
Margaret Bartimole, Yasmin Dasilva, Celia Matthews, Ethan Pickett, Monique Tribble, Kamilah Wright  

*Departments*  
English, The Crucible Literacy Magazine  

*Keywords*  
Creative Writing; Art; Reading; Literary Magazine

The six student interns who edit and publish The Crucible, Earlham’s literary and visual art magazine, will present on the editorial process behind the Spring 2019 issue: from promotion to selection to layout to launch. The issue itself, featuring an estimated fifty pieces of creative writing and artwork from Earlham students, will be available for pickup at the event. The presentation will also showcase the work of a few contributors and the winner of the inaugural Crucible Editors’ Prize. Come join us to celebrate the creative arts at Earlham, pick up your free copy of The Crucible, and learn how to get involved with the magazine next year!

D.7 **Earlham Historical Journal 10th Anniversary**  
Location: LBC 211  

*Presenters*  
Rowan Hellwich, Perla Cervantes, Karen Breece, Jackson Gage, Kai Kim, Emily Rosenberg, Asa Kramer-Dickie, Rachel Sames  

*Department*  
History  

*Keywords*  
History; Interdisciplinary; Student-led; Collaborative

We will be showcasing the journals that have been published in the past 10 years that the Earlham Historical Journal has been running. Our event will consist of members presenting on the experience of editing and working with fellow Earlhamites on history papers. We want to highlight that the journal is not just for history majors but is an example of Earlham’s tradition of interdisciplinary study and collaboration. We welcome students and faculty from all departments to engage with us and the work we have been doing for the past 10 years.
Wednesday, April 17
Afternoon Events

All Campus Lunch
12:00 p.m. – 1:30 p.m.
Location: Dining Hall

Join with others from across the college for the all-campus lunch on Wednesday, April 17th. Students should enter for lunch as usual. Employees of the college should enter through the patio doors by the dining hall that lead into the Friends Rooms, but are welcome to sit anywhere after getting self-serve lunch in the main dining hall.

Awards Convocation
1:30 p.m. – 3:00 p.m.
Location: Goddard Auditorium in Carpenter Hall

Our annual Awards Convocation takes place in Goddard Auditorium in Carpenter Hall. At this event, we celebrate and honor the achievements of our students in the classroom, on the field, and in the community. Come celebrate with us!

Earlham Day Festival
3:00 p.m. – 4:30 p.m.
Location: The Heart
Rain Location: Trueblood Courts in AWC

Earlham Day celebrations happen all over the world, including The Heart. Mingle with members of the Earlham community, play games, eat ice cream, and help pave the way for current and future generations of Earlham students.