



Student RESEARCH Handbook *2023*



LUDDY SCHOOL OF INFORMATICS, COMPUTING, AND ENGINEERING
INDIANA UNIVERSITY

Table of Contents

How does research work at Luddy?	1
Programs	1
Responsibilities	2
Final Products	2
How do you get involved?	3
Faculty Research Groups	
Cross-cutting Research Groups	4
Artificial Intelligence	4
Data Science	7
Health	9
Human Computer Interaction (HCI)	11
Security & Privacy	12
Sensors & Materials	13
Teaching & Learning	14
Intra-Department Research Groups	15
Department: Informatics	15
Animal Informatics	15
Complex Networks & Systems	16
Computing, Culture & Society	17
Digital Heritage	18
Ethics & Values in Digital Society	19
Proactive Health	21
Department: Computer Science	22
Bioinformatics & Computational Biology	22
Programming Languages	22
Theoretical Computer Science	23
Department: Intelligent Systems Engineering	24
Embedded Systems Security	24
Engineering Health	24
High Performance & Cloud Computing	25
Intelligent Systems	26
Department: Information & Library Science	27
Information & Library Science	27
Social Informatics	28

Student Research@Luddy

Welcome to Student Research@Luddy! As a Luddy student, you have many great research opportunities available to you. This booklet is designed to help you learn more about these opportunities. Additionally, it includes information such as how to contact faculty, what typical research responsibilities involve, where to find up-to-date research project information, and detailed information about the faculty and their research areas.

The production of this document is a collaboration between Luddy's Associate Dean for Research (ADR) and the Office of Student Engagement and Success.

How does research work at Luddy?

While you may have heard classmates or faculty mention research, it may still be unclear what "research" entails. In this section, we will dive into how research typically works at Luddy, including programs, responsibilities, and final products.

Programs

Although you can contact faculty members directly about research opportunities (see "How Do I Get Involved?" section), there are programs at Luddy which can help you. You can find more information about the various research programs offered here:

<https://luddy.indiana.edu/research/student-research/index.html>.

Near the beginning of each semester, an email is sent to undergraduates containing registration information. This email also includes information about research projects you can work on.

After selecting your desired research projects, you will be assigned to a project and be given your faculty mentor's email. This faculty mentor will help you learn the skills necessary to work on the project and acclimate you to the work. However, make sure to select the credit hours you would like to receive carefully.

You can take 1, 2, or 3 credit hours of undergraduate research per semester. Each credit hour corresponds to 3 hours of work; for example, signing up for 3 credit hours of undergraduate research means that you should be prepared to work 9 hours per week on your designated project. Please note that you can initially only sign up for 1 credit hour and will have to apply for 2 or 3.

Along with gaining invaluable work experience to put on your resume and skills to carry with you in your future endeavors, you will be required to make a research poster to present at the end of the semester. This is not just another experience you can put on your resumé, but also a chance to present your work at an open poster session to faculty and peers.

Another opportunity provided at IU for undergraduates is **REU**, or Research Experiences for Undergraduates. This program spans beyond Luddy and thus can provide you with experience working in other research areas.

REUs give you a chance to research up to 40 hours per week over the summer. In addition to working with experts in the field, some positions are paid. Whether the position is paid or unpaid, you will have an opportunity to contribute to a publication, poster, device, or other projects.

Responsibilities

The responsibilities given to student researchers can vary greatly depending on the lab, research center, or project. It is important to balance this work alongside classwork. Faculty members understand that you need to devote a certain amount of time to your classes. If you join a research project, you will typically be expected to work at least a few hours per week. Therefore, it is important to be clear about your availability to work as early as possible.

Additionally, be sure to inquire about the responsibilities you will be given in your position. This includes the time that would be required from you per week. Although it's important to be flexible because some weeks may have different workloads and may require more or less time than previous weeks.

An excellent way to keep track of what will be needed from you is to stay in contact with your faculty or student project mentor. Many labs and research centers meet weekly to give project updates. These meeting times are a good place to receive input on what is needed from you in the future.

Final Products

Each research team at Luddy works toward its own goals. These goals include creating research papers, devices, programs, or other products. Research papers are detailed text summaries of a project. They can also include reviews of multiple other publications. After completing a research paper, the lab may submit a draft to be published. Once published, the research paper is officially considered a "publication" and can be seen in magazines, on websites, or included in other forms of media. This publication can then be cited in future research papers.

As a student researcher working on a project, you may be considered a co-author of a research paper for that project. Once published, you may list that publication on your resume or CV. Additionally, if you provided code belonging to a public repository, you may provide a link to that repository on your personal website or CV. If you completed a physical device, you may also add a description for that device on your resume.

How do you get involved?

There are a few ways you can get involved with research at Luddy. In addition to the programs described at <https://luddy.indiana.edu/research/>, some faculty have been profiled in *The Luddy Tribune*, a periodic update provided in slides on the monitors throughout Luddy. All editions of *The Luddy Tribune* can be found at <https://bit.ly/LuddyResearchTribune>. In addition, you can always contact the faculty member you are interested in working with directly.

In the Faculty Research Groups section of this booklet, there is information provided about all the research groups in which faculty are involved. This section provides a brief description of the research interests of the group, the faculty involved (including contact information), and the centers, labs, and groups that are associated with them. If you identify a faculty member, lab, or center of interest, feel free to email them directly. Contacting these faculty members about research is a great way to show your interest in the project as well as your initiative.

If you contact a faculty member or lab by email directly, give a brief introduction of yourself in the first message. It is important to note that professors often have many emails in their inbox, so following up with the professors a few days after not receiving a response is advised. If there is still no response, you can either speak to your academic advisor about getting in contact with the faculty member or look into other ways to get in contact with the lab (ex. main lab phone numbers, official lab email addresses, etc.).

Here is an example of an email that could be sent to a professor about your interest in the research area:

Subject: Research Inquiry at The Fake Lab

My name is John Doe and I am currently a freshman studying computer science. I am emailing you because I am interested in learning more about research opportunities at The Fake Lab.

I am interested in artificial intelligence, data mining, and UI/UX. Additionally, I have experience programming in Python and am taking courses on machine learning, such as ENGR-E 222.

After researching the work conducted by The Fake Lab, I am excited for the opportunity to contribute to projects such as Project A. Would you have time to meet this week to discuss this further? I am available Tuesday through Friday after 2:00. Please let me know if there is any further information you require in the meantime.

Sincerely,

John Doe

Indiana University Class of 2027

Please note that this email is just an example to give you an idea on how to address faculty about your research interest. Make sure to be honest about your interests and skills as this will give faculty members an idea on how you can fit into the lab.

Once the faculty member agrees to meet with you, make sure to come prepared with any questions you have about the lab. Please note that this meeting is not a job interview and you do not need to prepare as such. The meeting is to meet the faculty member and learn more about you and how you can fit into the lab. From there, you can truly begin your research experience!

Faculty Research Groups

Luddy faculty research interests are broad and varied. Faculty have organized themselves into 23 distinct research groups. Seven research areas cut across faculty in several departments (*Computer Science, Informatics, Intelligent Systems Engineering, and Information & Library Science*) and 16 are comprised of faculty that are smaller and primarily composed of intra-department faculty.

Listed below is a brief description of each research group and the names and email addresses of faculty involved each one. If you are interested in working on research projects in any area, take the initiative to review the information provided at the link below each description and connect with one or more of the faculty members in the area. Don't just focus on full professors, all faculty are involved in research and assistant and associate professors may afford you the opportunity to work with a young faculty member at the start of their research career.

Cross-cutting Research Groups

The seven Cross-cutting research groups shown below are comprised of faculty members in multiple departments in Luddy. They are identified with the @Luddy extension, helping to differentiate these groups from the smaller, intra-department groups.

Artificial Intelligence@Luddy

Computers can now defeat the best humans in complicated games like Chess, Go, and even Jeopardy. But despite some 70 years of active research, computers still lack the general intelligence and capabilities of even a small child. Artificial Intelligence research at Indiana University includes diverse faculty and students investigating a wide variety of areas, problems, and approaches about artificial systems that perceive, understand, learn from, react to, and interact with the world around them.

Applications of AI and machine learning are a central focus: developing new algorithms and models, improving scalability for large, noisy data, understanding the connections to human

cognition, behavior, and health, and a wide variety of other problems, along with studying their theoretical properties and limitations.

<https://luddy.indiana.edu/research/research-areas/artificial-intelligence.html>

Faculty in the Artificial Intelligence Research Group

(Highlighted names are primarily AI)

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Samantha Wood	Assistant Professor	sw113@indiana.edu
Yuzhen Ye	Professor	yye@indiana.edu
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Xuhong Zhang	Assistant Professor	zhangxuh@indiana.edu_

Centers, labs, and groups associated with Artificial Intelligence & Machine Learning:

- Audio, SPeech, and Information RETreival (ASPIRE) Research Group — <https://aspire.sice.indiana.edu>
- Center for Bioinformatics Research — <https://cbr.indiana.edu/>
- Center for Complex Networks and Systems Research — <https://cnets.indiana.edu>
- Center for Distributed Confidential Computing (CDCC) — <https://nsf-cdcc.org/>
- Center for Machine Learning — <https://cml.luddy.indiana.edu>
- Center for Programming Systems — <https://luddy.indiana.edu/research/centers/center-programming-systems.html>
- Center for Social and Biomedical Complexity — <https://csbc.luddy.indiana.edu/>
- Computer Vision Lab — <https://vision.soic.indiana.edu/>
- Garyfalidis Research Group — <https://grg.sice.indiana.edu/>
- Observatory on Social Media — osome.iu.edu
- R-house Living Laboratory for Research in Human-Robot Systems — <https://r-house.luddy.indiana.edu/>
- Signals & Artificial Intelligence Group in Engineering — <http://saige.sice.indiana.edu>
- Soda Lab — <https://soda-labo.github.io/>
- Virtual World Heritage Lab — <https://vwhl.luddy.indiana.edu/>
- Vehicle Autonomy and Intelligence Lab — <https://vail.sice.indiana.edu>

Data Science@Luddy

This group is dedicated to advancing research in data science in areas such as machine learning, high performance computing, cloud computing, bioinformatics, complex systems, algorithms, database theory and database management. Our cross-disciplinary research in the area of large-scale data and search encompasses data mining, long-term preservation and computational access to large-scale data.

<https://luddy.indiana.edu/research/research-areas/data-science.html>

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Centers, labs, and groups associated with Data Science:

- Audio, SPeech, and Information RETreival (ASPIRE) Research Group — <https://aspire.sice.indiana.edu>
- The Algorithms Group — <https://algorithm.sice.indiana.edu/people/>
- Center for Complex Networks and Systems Research — <http://cnets.indiana.edu/>
- Crisis Technologies Innovation Lab — <https://ctil.iu.edu>
- Cyberinfrastructure for Network Science Center — <https://cns.iu.edu>
- Data to Insight Center — <https://pti.iu.edu/centers/d2i/>
- Networks & agents Network (NaN) — <http://cnets.indiana.edu/groups/nan/>
- Observatory on Social Media — <https://osome.iu.edu/>
- Societal Computing Lab — <https://soco.luddy.indiana.edu/>

Health@Luddy

This group works to advance research in health and biology by tackling grand challenges through intra and interdisciplinary collaborations. A key advantage of Health@Luddy is the broad expertise in one school. Collaborators can find synergistic opportunities that explore sociotechnical systems from micro to macro scales at biological, environmental, physiological, individual, community, and global levels.

<https://luddy.indiana.edu/research/research-areas/health-luddy.html>

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Centers, labs, and groups associated with Health:

- Audio, SPeech, and Information RETreival (ASPIRE) Research Group — <https://aspire.sice.indiana.edu>
- Biocomplexity Institute — <https://biocomplexity.indiana.edu/>
- Center for Bioinformatics Research — <https://cbr.indiana.edu/>
- Center for Complex Networks and Systems Research — <https://cnets.indiana.edu/>
- Center for Genomics and Bioinformatics — <https://cgb.indiana.edu/>
- Complex Adaptive Systems & Computational intelligence — <http://cnets.indiana.edu/groups/casci/>
- Cyberinfrastructure for Network Science Center — <https://cns.iu.edu>
- Fibers and Additive Manufacturing Enabled Systems Laboratory (FAMES Lab) — <https://fames.indiana.edu/>
- Network Science Institute — <https://iuni.iu.edu/>
- Proactive Health Lab — <https://prohealth.sice.indiana.edu/>
- R-house Living Laboratory for Research in Human-Robot Systems — <https://r-house.luddy.indiana.edu>
- Societal Computing Lab — <https://soco.luddy.indiana.edu/>
- Socioneural Psysiology Lab — <https://sociophysio.org/>

HCI@Luddy

Human-Computer Interaction (HCI) research investigates how humans engage with computing, addressing concerns such as usability, accessibility, user experience, and much more. As computing has reached out into virtually every domain of human life, our interactions with computers increasingly mediate our relationships with the world, our work, each other, and ourselves. Luddy's large and interdisciplinary group of HCI researchers, is internationally recognized for its contributions to the field.

<https://luddy.indiana.edu/research/research-areas/hci-luddy.html>

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Centers, labs, and groups associated with HCI:

- Center for Applied Cybersecurity Research — <https://cacr.iu.edu/>
- Center for Computer-Mediated Communication — <https://ccmc.ils.indiana.edu/>
- Center for Integrative Study of Animal Behavior — <https://animalbehavior.indiana.edu/>
- Center for Security and Privacy in Informatics, Computing, and Engineering — <https://spice.sice.indiana.edu/>
- Human and Technical Security — <https://www.usablesecurity.net/>
- Institute for Digital Arts and Humanities — <https://idah.indiana.edu>
- Privacy Lab — <https://privacy.luddy.indiana.edu/>
- Proactive Health Lab — <https://prohealth.sice.indiana.edu>
- R-house Human-Robot Interaction Lab — <https://r-house.sice.indiana.edu/>
- Rob Kling Center for Social Informatics — <https://rkcsi.sice.indiana.edu>
- Societal Computing Lab — <https://soco.luddy.indiana.edu/>

Security & Privacy@Luddy

Our research, education, and outreach support security and privacy for everyone. Computer security and data privacy are integrated into all our lives, from caregiving to warfighting. Fulfilling the resulting wide-ranging security and privacy needs requires a holistic understanding of technologies and mastery of a wide range of scientific approaches. Leveraging interdisciplinary methods and deep technical expertise, the security and privacy group has made impact on individuals, populations, products, and marketplaces. We create technologies that support accessible usable interactions, marketplace incentives, safety priorities, and compliance. From examining code and communication at the bit level to analysis of macroeconomics of national behaviors, we offer a unique breadth and depth of scholarship, science, and service.

<https://luddy.indiana.edu/research/research-areas/security-privacy.html>

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Centers, labs, and groups associated with Security & Privacy:

- Center for Applied Cybersecurity Research (CACR) — <https://cacr.iu.edu/>
- Data to Insight Center (D2I) — <https://pti.iu.edu/centers/d2i/index.html>
- Human and Technical Security Lab — <https://www.usablesecurity.net/>
- IoT Research Center — <https://iot.luddy.indiana.edu/>
- Observatory on Social Media (OSoMe) — <https://osome.iu.edu/>
- OPeN Programmable Networks Lab — <http://open.sice.indiana.edu/>

- Privacy Lab — <https://privacy.luddy.indiana.edu/>
- Security and Privacy in Informatics, Computing, and Engineering — <https://spice.luddy.indiana.edu/>

Sensors & Materials@Luddy

Luddy faculty in all departments are engaged in research activities encompassing the multidisciplinary fields of sensing technology. Their original work in area includes both experimental and theoretical fields aimed at understanding sensing technology, related materials, associated phenomena, and applied systems.

<https://luddy.indiana.edu/research/research-areas/sensors-materials-luddy.html>

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Centers, labs, and groups associated with Sensors & Materials:

- Environmental Sensor Network
<http://healthycities.sice.indiana.edu/sensor/index.html>
- Fibers and Manufactured Enabled Systems (FAMES) Lab
<https://fames.indiana.edu/research/index.html>
- Proactive Health Lab <https://prohealth.luddy.indiana.edu/>
- Intelligent BioMedical Systems (IBMS) Lab <https://frankfengguo.weebly.com/>
- Security and Privacy in Informatics and Computing (SPICE) Lab
<https://spice.luddy.indiana.edu/>

Teaching & Learning@Luddy

Teaching and learning faculty investigate the practice of teaching as a scholarly pursuit. We examine pedagogy practices, student learning outcomes, and strategies for collecting and analyzing data related to teaching informatics, computer science, library science, and engineering. Members of this research group participate in ongoing dialogs about these topics with other researchers in these fields.

<https://luddy.indiana.edu/research/research-areas/teaching-and-learning.html>

Faculty in the Teaching & Learning Research Group

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No centers, labs, or groups associated with Teaching and Learning

Intra-Department Research Groups

The 16 intra-department research groups are organized by the department primarily engaged in the area. While these groups are mainly comprised of faculty from a single department, they are open to any faculty member. These research groups are smaller than cross-cutting groups and tend to be focused more narrowly.

Department: Informatics

Animal Informatics

Animal Informatics, including the subfield of Animal-Computer Interaction, is an applied research program of interest to the pet care industry, captive animal management (e.g., zoos, aquariums, livestock), animal welfare organizations, assistive and therapeutic support animal programs, veterinary medicine, wildlife conservation, and the cognitive, biological, and evolutionary sciences.

<https://luddy.indiana.edu/research/research-areas/animal-informatics.htm>

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Justin Wood
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Centers, labs, and groups associated with Animal Informatics:

- Center for the Integrative Study of Animal Behavior — <https://animalbehavior.indiana.edu/>
- Cognitive Science Program — <https://cogs.indiana.edu/>
- R-house Living Laboratory for Research in Human-Robot Systems — <https://r-house.luddy.indiana.edu>
- Societal Computing Lab — <https://soco.luddy.indiana.edu/>
- Wood Lab — <http://www.buildingamind.com/>

Complex Networks & Systems

Our complex networks and systems program fosters interdisciplinary research and education. Faculty in the program are organized in the Center for Complex Networks and Systems Research (CNetS), the Observatory on Social Media (OSoMe), and the Center for Social and Biomedical Complexity (CSBC), each encompassing various labs and projects. Our program draws on world-class faculty who foster a highly dynamic and collaborative work environment. Our researchers study multi-scale networks and dynamical processes that extend across social, informational, technological, infrastructural, biological, and ecological systems.

<https://luddy.indiana.edu/research/research-areas/complex-networks-systems.html>

Faculty in the Complex Networks & Systems Research Group

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Centers, labs, and groups associated with Complex Networks and Systems:

- Center for Complex Networks and Systems Research — <https://cnets.indiana.edu/>
- Center for Social and Biomedical Complexity — <http://csbc.sice.indiana.edu/>
- CoNeX — <https://cnets.indiana.edu/groups/conex/>
- Networks & agents Network (NaN) — <https://cnets.indiana.edu/groups/nan/>
- Observatory on Social Media — <https://osome.iu.edu/>
- Soda Lab — <https://soda-labo.github.io/>

Computing, Culture & Society

The CCS research group converges around a common concern for the issues that emerge at the intersection of technological innovation and social, political, cultural, economic phenomena. From artificial intelligence and social media, gaming, domestic and workplace applications, rich data and big data, to mobile platforms, computing technologies are a constant presence in our lives. We are interested in how these technologies modulate existing structures of power, domination, oppression, and inequity. A highly interdisciplinary group, we draw on multidisciplinary backgrounds and a wide range of methods in their work, including case study, design, ethnographic, experimental, historical, survey, and visual methods.

<https://luddy.indiana.edu/research/research-areas/computing-culture-society.html>

Faculty in the Computing, Culture & Society Research Group

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Centers, labs, and groups associated with Computing, Culture & Society

- Center for Research on Mediation — <http://crom.luddy.indiana.edu/>
- R-House Lab — <http://r-house.sice.indiana.edu/>

Digital Heritage

UNESCO characterizes “cultural heritage” either by its tangible components (monuments, collections of objects, and any book, manuscript, or physical document attesting culture) or by its intangible components (such as traditions or living expressions inherited from our ancestors and passed to us in non-physical form). Many national and state legislatures define the tangible heritage for which they take responsibility, but heritage value may also be based on what is important to small groups, communities, or diasporas. Anything considered important enough to be passed on to the future can be considered to have heritage value of some kind, independently of how ancient or widely appreciated and protected it is. The unique combination of expertise at the Luddy School supports for such research activity within the following domains: virtual heritage, computational literary studies, digital libraries and archives, digital history, AI, and AR/VR for digital twin environments.

<https://luddy.indiana.edu/research/research-areas/digital-heritage.html>

Faculty in the Digital Heritage Research Group

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Center associated with Digital Heritage:

- Virtual World Heritage Lab -- <https://vwhl.luddy.indiana.edu/>

Ethics & Values in Digital Society

Recent innovations in information technology are challenging our traditional notions of what it means to live a good and productive life, and to assure that the digital world reflects our ethical values. From the ethical issues associated with artificial intelligence to the growing breakdown of trust, accountability, civility, and consensus in online spaces, Luddy researchers are engaging with some of the most meaningful social, political, and moral questions facing our digital society.

<https://luddy.indiana.edu/research/research-areas/ethics-values-digital-society.html>

Faculty in the Ethics & Values in Digital Society Research Group

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Centers, labs, and groups associated with Ethics & Values in Digital Society:

- Center for Complex Networks and Systems Research -- <https://cnets.indiana.edu/>
- Observatory on Social Media -- <https://osome.iu.edu/>
- Rob Kling Center for Social Informatics -- <https://rkcsi.sice.indiana.edu/>

Human-Computer Interaction/design

Successful IT products often push technical boundaries, but they also often meet—and even reveal— human needs and desires. As a field, HCI/d focuses on the ways that technologies can address needs that result in desired experiences. That is, HCI/d seeks to understand and advocate for users and other stakeholders, melding such insights with technologies to craft tools, systems, and services. HCI/d at Indiana University is internationally recognized for its leadership in developing a design-oriented HCI research and practice. Integrating social science, aesthetic crafting, cutting edge technologies, and

business strategy, this discipline is capable of envisioning and producing futures that are both desirable and impactful.

<https://luddy.indiana.edu/research/research-areas/human-computer-interaction-design.html>

Faculty in the Human-Computer Interaction/design Research Group

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Centers, labs, and groups associated with HCI/d:

- Center for Applied Cybersecurity Research — <https://cacr.iu.edu/>
- Center for Computer-Mediated Communication — <https://ccmc.ils.indiana.edu/>
- Center for integrative Study of Animal Behavior — <https://animalbehavior.indiana.edu/>
- Center for Security and Privacy in Informatics, Computing, and Engineering — <https://spice.sice.indiana.edu/>
- Institute for Digital Arts and Humanities — <https://idah.indiana.edu>
- Proactive Health Lab — <https://prohealth.sice.indiana.edu/>
- R-house Living Laboratory for Research in Human-Robot Systems — <https://r-house.luddy.indiana.edu>
- Rob Kling Center for Social Informatics — <https://rkcsi.sice.indiana.ed>
- Societal Computing Lab — <https://soco.luddy.indiana.edu/>

Proactive Health

This group is internationally renowned for designing, building, and evaluating technologies to empower individuals to better understand, manage, and improve their everyday health. ProHealth researchers make valuable socio-technical contributions to aging-in-place, healthcare journeys, personalized consumer health sensing, the internet of things, environmental sensing, urban and rural health, online health communities, and social support. We engage populations through user-centered design, participatory design, and novel social computing methods. Proactive Health Informatics at Indiana University Bloomington has developed a pipeline of training programs for K-12, undergraduate, graduate, and postdoctoral researchers to develop the next generation of innovators.

<https://luddy.indiana.edu/research/research-areas/proactive-health.html>

Faculty in the Proactive Health Research Group

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Labs associated with Proactive Health:

- Proactive Health Lab — <https://prohealth.sice.indiana.edu/>
- Societal Computing Lab — <https://soco.luddy.indiana.edu/>

Department: Computer Science

Bioinformatics & Computational Biology

This group develops computational techniques to contribute to research in microbiology, evolution, proteomics and glycomics, systems biology, and human disease.

<https://luddy.indiana.edu/research/research-areas/bioinformatics-computational-biology.html>

Faculty in the Bioinformatics & Computational Biology Research Group

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Centers associated with Bioinformatics & Computational Biology

- Center for Bioinformatics Research — <https://cbr.indiana.edu/>
- Center for Genomics and Bioinformatics — <https://cgb.indiana.edu/>

Programming Languages

Research in programming languages ranges from the practical side to the foundational side. Our practical research helps programmers become more productive and efficient through approaches such as gradual typing and probabilistic programming. We are also working to build bridges between mainstream languages and cutting-edge approaches, such as logic programming, that will enable programming at a higher level. Our studies of the foundations of programming explore connections with other fields to discover how they are interrelated and attempt to identify patterns that can be useful in other disciplines, such as quantum physics.

<https://luddy.indiana.edu/research/research-areas/programming-languages.html>

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Center associated with Programming Languages:

- Center for Programming Systems — <https://luddy.indiana.edu/research/centers/center-programming-systems.htm>

Theoretical Computer Science

The research interests of faculty in theoretical foundations of computer science cover a wide spectrum of topics. One unifying principle that ties the research of faculty together is the focus on concepts that lie at the core of computing and programming.

<https://luddy.indiana.edu/research/research-areas/theoretical-computer-science.html>

Faculty in the Theoretical Computer Science Research Group

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No centers, labs, or groups associated with Theoretical Computer Science

Department: Intelligent Systems Engineering

Embedded Systems Security

With the exponential expansion of the Internet of things (IoT), embedded systems control most of the technologies with which we interact. Until recently, the security of such systems has been little studied. Luddy ISE is the place to find this.

<https://luddy.indiana.edu/research/research-areas/embedded-systems-security.html>

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Centers, labs, and groups associated with Embedded Systems Security:

- SAIL-IN: Systems Assurance and Integrity Lab of INdiana — <https://sailin.luddy.indiana.edu/index.html>
- Biocomplexity Institute — <http://www.biocomplexity.indiana.edu/>
- Cyberinfrastructure for Network Science Center — <https://cns.iu.edu/>
- Data to Insight Center — <https://pti.iu.edu/centers/d2i/>

Engineering Health

This group addresses the most pressing challenges in biology and medicine from an engineering perspective. Maintaining health and preventing disease by monitoring changes in patient state and intervening before the onset of disease. When diseases occur, providing regulated treatment based on patient response rather than on a predetermined therapeutic strategy.

<https://luddy.indiana.edu/research/research-areas/engineering-health.html>

Faculty in the Engineering Health Research Group

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Centers, labs, and groups associated with Engineering Health:

- The Biocomplexity Institute — <https://biocomplexity.indiana.edu/>
- The Bondesson Lab — homes.sice.indiana.edu/mbondess
- FAMES (Fibers and Additive Manufacturing Enabled Systems) Lab — fames.indiana.edu
- Garyfallidis Research Group and Medical Imaging Laboratory — grg.sice.indiana.edu
- MathCancer Lab — <http://mathcancer.org/>
- Signals and AI Group — saige.sice.indiana.edu

High Performance & Cloud Computing

This world-renowned research group works on projects that push the limits of high-performance computing. In addition to their collective experience and expertise, the facilities available only at Indiana University provides this unique group the power to explore new frontiers in technology and data analytics. Big Red 200, our new artificial intelligence system, is the first next-gen supercomputer based on HPE's Cray Shasta architecture deployed in the world. Jet Stream, another innovation led by the Indiana University faculty, adds cloud-based, on-demand computing and data analysis resources to the national cyberinfrastructure.

<https://luddy.indiana.edu/research/research-areas/high-performance-cloud-computing.html>

Faculty in the High Performance & Cloud Computing Research Group

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No centers, labs, or groups associated with HP & Cloud Computing

Intelligent Systems

We push the limits of artificial intelligence and machine learning to engineer the cutting-edge systems in which this intelligence is efficiently embedded. We team up with colleagues across disciplines to build customized intellects for engineering applications that understand and react to events in the human body, changes in our environment, the dynamics of molecules, and various sensor signals.

<https://luddy.indiana.edu/research/research-areas/intelligent-systems.html>

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Centers, labs, and groups associated with Intelligent Systems:

- Biocomplexity Institute — <https://biocomplexity.indiana.edu/>
- Cyberinfrastructure for Network Science Center — <https://cns.iu.edu/>
- Data to Insight Center — <https://pti.iu.edu/centers/d2i/>
- IU Network Science Institute — <https://iuni.iu.edu/>
- Jadhao Research Group — <https://jadhaolab.engineering.indiana.edu/>
- Signals and AI Group in Engineering (SAIGE) — <http://saige.sice.indiana.edu>
- Uncharted Research Group — <https://jiang60.pages.iu.edu/>

Department: Information & Library Science

Information & Library Science

This group analyzes, evaluates, designs, and manages technologies to support effective organizational activities, work practice, and human usability. Investigate the preservation, organization, and access to records and documents in all physical and digital formats. Consider the use and circulation of records and documents and the social and cultural institutions, that house them.

<https://luddy.indiana.edu/research/research-areas/information-library-science.html>

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Centers, labs, and groups associated with Information and Library Science:

- Center for Computer-Mediated Communication (CCMC) — <https://ccmc.ils.indiana.edu/>
- Data to Insight Center — <https://pti.iu.edu/centers/d2i/>
- Institute for Digital Arts and Humanities — <https://idah.indiana.edu>
- Hathi Trust Research Center — <https://www.hathitrust.org/htrc>
- Rob Kling Center for Social Informatics (RKCSI) — <https://rkcsi.sice.indiana.edu/>

Social Informatics

This group examines the social aspects of computerization, including the roles of information, and communication technologies, in social and organizational change, the design and uses of information communication technologies (ICTs) in social contexts, and the ways in which the social organization of ICTs is influenced by social forces and social and organizational practices.

<https://luddy.indiana.edu/research/research-areas/social-informatics.htm>

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Centers, labs, and groups associated with Social Informatics:

- Center for Computer Mediated Communication — <https://ccmc.ils.indiana.edu/>
- Rob Kling Center for Social Informatics — <https://rkcsi.sice.indiana.edu/faculty/>
- R-house Living Laboratory for Research in Human-Robot Systems — <https://r-house.luddy.indiana.edu>
- Societal Computing Lab — <https://soco.luddy.indiana.edu/>

