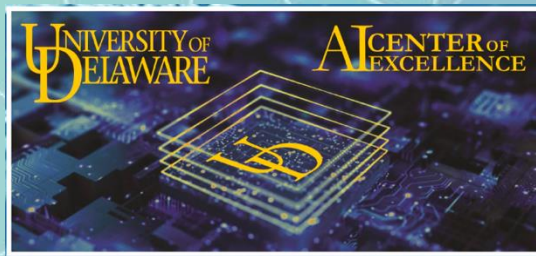


# AI Center of Excellence at University of Delaware

Co-Directors: Prof. Sunita Chandrasekaran  
and Prof. Kathy McCoy, UD CIS



## Center Highlights

Years in Review 2022-2024

Content Prepared by Samantha Smith



# AI Center of Excellence Seed Funding Program

The center's seed funding program aimed to provide support to various AI projects at UD through funds, Research Software Engineer support, or undergraduate researcher support.

PROPOSALS RECEIVED:  
**30**

SEED FUNDED PROJECTS:  
**12**

TOTAL AMOUNT AWARDED  
FROM AICOE:  
**\$117,632**

**IMPACT:**  
EXTERNAL FUNDING AWARDED TO  
SEED FUNDED PROJECTS:

**\$6.1 Million**

AND over \$28.6 MILLION in  
PROPOSALS UNDER REVIEW  
BY EXTERNAL FUNDERS!

**ROI → 50X**

DOD

NASA

AWS

RALLY  
FOUNDATION

INSTITUTE FOR  
ENGINEERING  
DRIVEN HEALTH

NSF

GENERAL  
UNIVERSITY  
RESEARCH

**"CoachGPT: AI-based Scaffolding Tools  
for Teaching Academic Writing"**

Prof. Hui Fang, Prof. Xiaoming Li, Prof.  
Joshua Wilson



**"AI/ML Enabled Surrogate Modeling to  
Tackle -Multi-Scale Challenges Due to  
Climate Change"**

Prof. Tian-Jian Hsu (Tom)

**"Data-driven Explanations for  
Knowledge Discovery in Seabed  
Morphodynamics Analysis"**

Prof. Xi Peng, Prof. Arthur Trembanis

**"Adaptive Thermal Emission Design  
Driven by AI"**

Prof. Xi Wang, Prof. Austin Brockmeier

**"Flexible AI for Mapping Agriculture in  
Africa"**

Prof. Kyle Davis, Prof. Federica Bianco

**"Generative Models of Realistic Brain  
Mechanical Property Maps"**

Prof. Curtis Johnson



**"Longitudinal Video Analysis of In-  
Home Parent Interactions for Motor  
Skills Interventions"**

Prof. Christopher Rassmussen, Prof.  
Michele Lobo



**"Radical Fashion: Digital Historical  
Reconstruction of 1920s Garments for  
Virtual Exhibition"**

Prof. Kelly Cobb, Prof. Dilia Lopez-  
Gydosh, Prof. Belinda Orzada

**"Predicting After-effects of  
ExoSkeleton-assisted Gait Training to  
Inform Human-in-the-loop Control  
Optimization"**

Prof. Fabrizio Sergi, Prof. Austin  
Brockmeier

**"Transformers for Socioemotional  
Behavior Assessment of Children with  
Autism"**

Prof. Leila Barmaki, Prof. Anjana Bhat,  
Prof. Kenneth Barner

**"Leveraging Machine Learning and  
Nanocomposites-based Wearable  
Sensors to Analyze Movements and  
Detect Abnormalities"**

Dr. Sagar Doshi, Prof. Erik Thostenson,  
Prof. Jill Higginson, Prof. Matthew  
Mauriello

**"Machine Learning for Computational  
LiDAR Imaging in Earth Science"**

Prof. Gonzalo Arce, Prof. Rodrigo Vargas





## AICoE – Our Vision

The AI Center of Excellence (AICoE), a Unidel funded initiative, which launched in summer 2022, aims to bring together researchers across campus who utilize AI in order to solve impactful problems. The goal is to increase UD's competitiveness by stimulating and capitalizing on existing AI work on campus and to foster interdisciplinary AI work both within the University of Delaware and with industrial and academic partners

## *Tech the Halls: Learn and Celebrate with AICoE*

Dec  
2024



The AI Center of Excellence hosted a holiday workshop to celebrate the end of 2024 and talk about the AI research happening at the University of Delaware. The event started with an AI101 Tutorial, where the foundational concepts and uses of AI were presented, followed by the AICoE's most recently-funded group of researchers explaining their work and progress, and finally, an exciting panel to discuss the impact of AI in industry, academia and every day life.

### AI 101 Tutorial - Presented by Yamini Pravallika Medapati and Aakanksh Chittiprolu, MSDS

This tutorial provides the fundamental concepts of Artificial Intelligence, designed for anyone wishing to understand what AI is and how it is used.

### AI in Action: Highlights from AICoE PIs

Presented by: **Hui Fang**, Dept. of Electrical and Computer Engineering  
**Tian-Jian Hsu**, Dept. of Civil and Environmental Engineering  
**Christopher Rasmussen**, Dept. of Computer and Information Sciences  
**Xi Wang**, Dept. of Material Sciences and Engineering  
**Sagar Doshi**, Center for Composite Materials

### Panel – Insights and Outlooks: AI at UD

**Rita Landgraf**, Professor of Practice & Distinguished Health  
**Johannes Doerfert**, Principal Member of Technical Staff, LLNL  
**Ryan Harrington**, Director of Strategy and Operations, Data Innovation Lab, Tech Impact  
**Rep. Krista Griffith**, Chair of State of DE AI Commission  
**Patrick Callahan**, Head of Data & Analytics & Innovation, Labware



Nov  
2024

The AICoE helped represent the University of Delaware at the world's largest SuperComputing (SC24) conference, held in Atlanta, GA.

At the University's booth on the exhibit floor, we showcased posters of AI, HPC and Data Science research from faculty and students across UD.

It was also a great platform to announce the new NSF-SCIPe grant awarded to Co-Director Sunita Chandrasekaran to build a Research Software Engineer (RSE) pipeline at UD.



## HPC + Data + AI Lunch Seminars

The HPC + Data + AI Lunch Seminar series brings together faculty, staff and students in the areas of Research Computing, including; High Performance Computing, Data Science, and Artificial Intelligence to discuss the needs, upcoming opportunities and computational resources available to UD researchers.

Oct  
2024

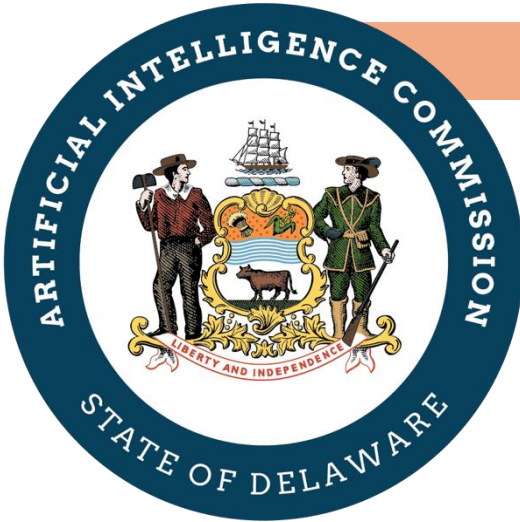
- Introducing the new Vice-President of Research, Miguel Garcia-Diaz
- Announcing the new NSF-SCIPe grant called "DARSE"
- Student Research Software Engineers (RSEs) from DARSE present the projects they are involved in and how their computational skills help domain scientists

July  
2024

- Keynote talk given by Utz-Uwe Haus, from Hewlett Packard Enterprise, HPC/AI EMEA Research lab
- Destination Earth Project: digital twin (identical visual representation) of the Earth in order use current weather patterns to later predict climate models 30 years ahead

May  
2024

- Research infrastructure at UD – A working group called IWG handles various aspects – both machines and experienced personnel
- Garnering interest in having Research Software Engineer team at UD
- NSF computing resources offered (NAIRR program)



## STATE OF DELAWARE AI COMMISSION MEETING

AICoE Co-Director Sunita Chandrasekaran was appointed as Vice Chair of the State of Delaware's AI Commission alongside Representative Krista Griffith. The center hosted the second commission meeting at the FinTech building on STAR campus on October 24, 2024.

Topics discussed amongst the committee and the public included:

- Broad overview of AI and its various components
- Formed subcommittee to evaluate the state's ability to build customized AI models
- Formed subcommittee to train state employees and educate the public on AI technology and safe use

## THE AICoE WELCOMED TWO GRADUATE RESEARCH ASSISTANTS FOR FALL 2024



**Lauren Olson**

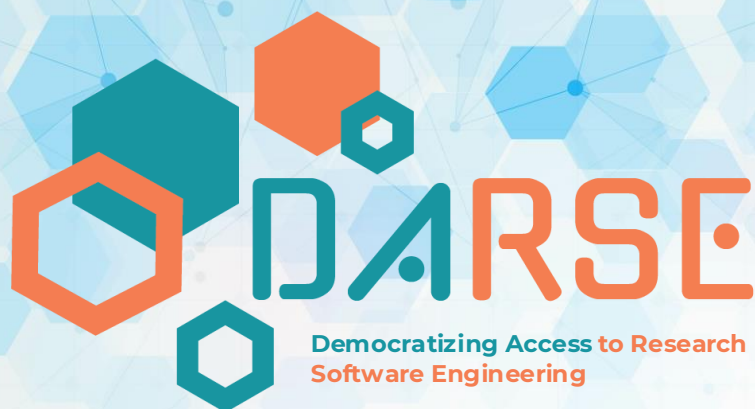
PhD Student, Dept. Computer & Information Sciences



**Aakanksh Chittiprolu**

Master's Student, Data Science



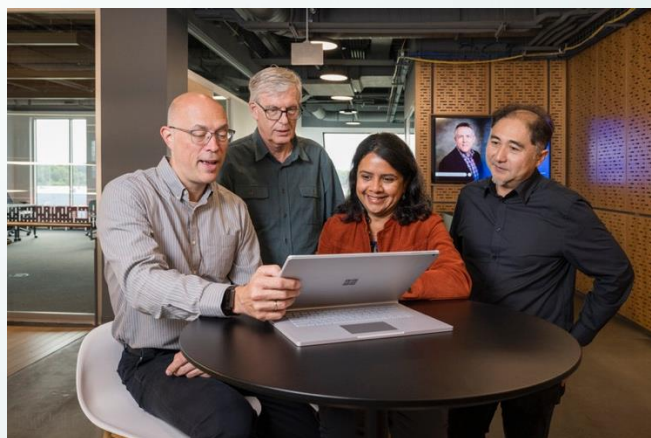


September 2024, Co-Director Sunita Chandrasekaran was awarded \$4.7 million as the PI for an NSF-SCIFE grant, which launched the DARSE (Dar-See) program

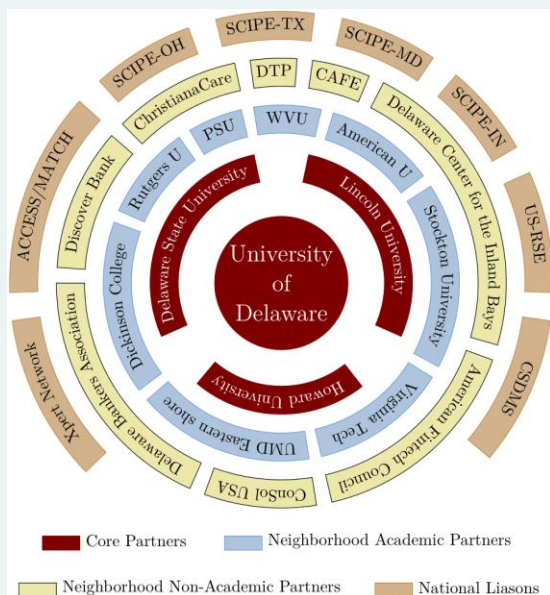
Our Mission is to democratize access to research software engineering (RSE) by creating an educational pipeline for RSE, building a team of RSE professionals and trainees, and engaging them in the advancement of computational, data-intensive, and AI-enabled science projects in the Mid-Atlantic region and beyond

### Project Goals

1. Identify and create a sustainable and scalable talent pipeline of RSEs to accelerate and enable domain sciences, especially in the SBE and CSI domain areas traditionally underserved by RSE
2. Connect RSEs from other initiatives such as NSF ACCESS, SCIFE and US-RSE to foster a broader network
3. Establish a graduate level course and RSE pilot certificate
4. Explore how data-driven ML/AI methods can be applied for problems in domain science



### DARSE Partnerships



### Current Projects

#### Dept of Political Science & International Relations

1. Offering policymakers and analysts new resources for monitoring the policy priority of less transparent regimes

#### Dept of Civil & Environmental Engineering

1. Enhancing urban planning, disaster preparedness and coastal flooding management
2. Predicting the size distribution of flocs in cohesive sediment transport – a crucial part of coastal and estuarine modeling for mitigating land loss

#### UD Athletics

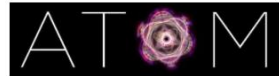
1. Improving student-athletes athletic development with the goal of increasing the national relevance of the University of Delaware brand

#### Dept. of Plant & Soil Sciences

1. Advances in methods for measuring soil greenhouse gas emissions—automated chamber—generate near-continuous observations.



# UD + ATOM HACKATHON 2024



**JULY 18-20<sup>TH</sup>** - The University of Delaware's AICoE and Data Science Institute (DSI) along with the ATOM team ran their first UD-Accelerating Therapeutics for Opportunities in Medicine (ATOM) Hackathon. The 3 day event provided an opportunity to solve drug discovery challenges and contribute to case studies in AI driven molecular modeling.



**PARTICIPATION**  
75 STUDENTS FROM UD,  
BOWIE STATE, DSU, PENN  
STATE AND UC BERKELY

## PROBLEM STATEMENT EXECUTION AWARD

### Team CompTox

Mentor: Pinyi Lu (FNL)  
Logan Hallee (UD), Niko Rafailidis (UD),  
Tom Le (UD), Colin Horger (UD), Nikhil  
Rao (NCAR)

## TECHNICAL COMPLEXITY AWARD

### Team Decay Detectives

Mentor: Vineeth Gutta (UD)  
Jay Shah (UD), Girogi Gvalia (UD),  
Tatiana Acell-Cuellar (UD), Janiya Davis  
(Bowie), Lauren Olson (UD)

## REMARKABLE IMPACT AWARD

### Team Amanda

Mentor: Amanda Paulson (UCSF)  
Peng He (Incyte), Nikhil Dhanankam  
(UD), Andrew Kallai (UD), Natalya  
Armenta (Bowie)

## CREATIVITY AND ORIGINALITY AWARD

### Team Code Guardians

Mentor: Herman Singh (MassMatrix)  
Nihaal Chowdary Surpani (UD), Vasavi  
Prasanna Kurapati (UD), Saieda Ali  
Zada (UD), Joel Duah (Bowie)



UNIVERSITY OF DELAWARE  
GRADUATE COLLEGE



ENGINEERING  
COMPUTER & INFORMATION SCIENCES



Center for Bioinformatics and Computational Biology





# Artificial Intelligence Graduate Certificate

**9** Credits of grad-level courses

## Why Learn AI?

This rapidly evolving field is integrated into so many aspect of daily life. Skills in building and training AI systems are highly sought-after across industries.

This certificate can open the door to a wide range of career opportunities and provide a competitive edge to your skillset.

## Sectors looking for AI experts

Finance

Healthcare

Technology

Manufacturing

Aug  
2023


Computer  
Vision

Data  
Mining

Machine  
Learning

Natural  
Language  
Processing

Multi-Agent  
Systems

 [ai-coe@udel.edu](mailto:ai-coe@udel.edu)

[sites.udel.edu/ai](https://sites.udel.edu/ai)

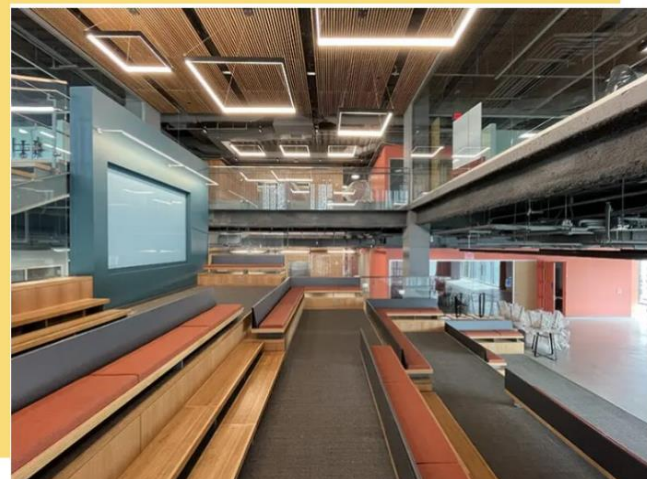


Aug 2023

New location!



The center moved locations from South Main Street to the brand new Fintech Innovation Hub (591 Collaboration Way) on STAR campus. Situated on the 4th floor, the AICoE is in a fantastic location for collaboration with Engineering and Lerner faculty, as well as industry folks in the Fintech building.



**Jul 2023**

The AICoE and Data Science Institute (DSI) co-hosted a 3 day hackathon where 70 participants tackled 11 challenging case studies across AI, Data Science and High Performance Computing. Focus areas included:



Health



Human-Computer Interaction



Predictive Models



Climate



Domain experts from UD and local industry partners submitted their case studies for UD students to work together and produce innovative solutions. The 11 teams presented their case study solutions on the final day and 4 teams walked away with an award sponsored by Tech Impact.



**"Kendal Transformers" - Technical Complexity**

(UD's Claudio Cesar, Mauricio Ferrato, Nikhil Rao and Kendal's Kurt Rahner, Jason Eldridge)



**"Chemical Innovators" - Problem Statement Execution**

(UD's Nihaal Cahwdary Surpani, Lalith Teja Nagidi, Hang Chen, Emma Cao, and Chemours' Maria van Venrooy, Austin Plymill)



**"Rain Makers" - Creativity**

(UD's Alyssa Zhang, Aman Singh, Amir Meydani, Christian Munley, Mahadev Maitri, Siamek Malakpour Estalaki)



**"Medical Marauders" - Impact**

(UD's Shreya Pamulapati, Shaquana Smith, Andrew Kallai, Talha Mahmood, Ben Bagozzi, and DSI's Mina Ostovari)



Jun  
2023



## Summer Institute on Teaching – AI Tools in Higher Education: A Technical Primer and Practical Examples

Co-Director Kathy McCoy and Postdoctoral Researcher Pinar Kullu prepared an overview of the technical side of AI tools in a non-technical way. ChatGPT was explained and examples were provided of how it might be used by both faculty and students in class. The emphasis was placed on critically analyzing ChatGPT output

Mar  
2023



## Co-Director Kathy McCoy spoke at Delaware's Tech Forum "AI in DE" event

Kathy McCoy joined a panel of Delaware industries spotlighting the everyday ways that AI is used across the state. Speaking from an educational perspective, Kathy highlighted the demand for AI education in the workforce, stating that students who study AI are getting hired very quickly after entering the job market

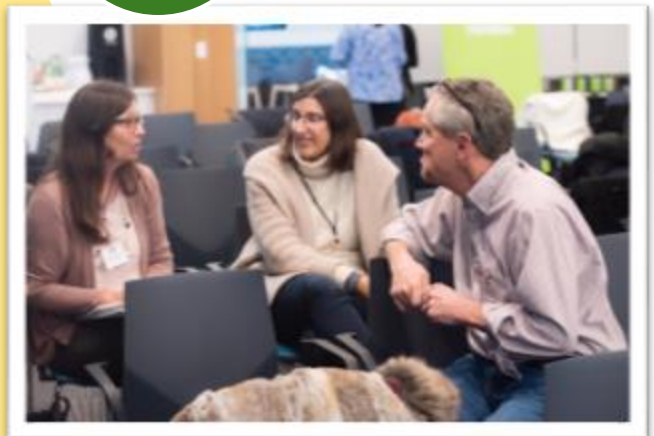
Jan  
2023

## The First AICoE Workshop

The workshop aimed to highlight the various AI-related projects across UD's campus. The awardees of the center's first round of seed funding provided short talks explaining their utilizations of AI across disciplines.

Industry panelists from NVIDIA, Microsoft, AMD, Labware, and UD Partnerships for Healthy Communities were invited to spark a discussion on AI in our everyday lives and how consumers drive advancements in hardware and software technologies.

The workshop concluded with an AI bootcamp run by the center's Postdoctoral Researcher Pinar Kullu that explored Machine Learning workflows



# The AICoE Launched September 2022



## Meet the AI CoE Team

### Co-Directors



Kathy McCoy  
Professor, CIS



Sunita Chandrasekaran  
Associate Professor, CIS

### Executive Committee



Jamie Philips  
Professor & Chair, ECE



Cathy Wu  
Program Director, DSI



Rudi Eigenmann  
Distinguished Professor, ECE

### Center Staff



Sam Smith  
Admin Assistant



Pinar Kullu  
Postdoc



Amani Kiruga  
Web developer

Have any questions, or wish to become an affiliated faculty member of the AI Center of Excellence?

**CONTACT US!**



[ai-coe@udel.edu](mailto:ai-coe@udel.edu)



302-831-8841