

AI Center of Excellence



At University of Delaware

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



Spring 2024 Newsletter

Content prepared by Samantha Smith

AI Center of Excellence—Our Vision

The AI Center of Excellence (AICoE), a Unidel funded initiative, which launched in the summer of 2022, aims to bring together researchers across campus who utilize AI in order to solve impactful problems. The center's co-directors, Prof. Kathy McCoy and Prof. Sunita Chandrasekaran set the goal 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.

Impact at UD

Utilizing AICoE Seed Funding in 2023 enabled Prof. Xi Peng and Prof. Arthur Trembanis to obtain \$577,852 from the Department of Defense (DoD).

- The project develops robust machine learning methods that can accurately and reliably detect objects in seafloor data.

AICoE seed funding support provided resources to 11 different AI interdisciplinary UD project

- Pilot funds
- Postdoctoral support
- Undergraduate researchers

"With support from colleagues across the university and AICoE, I submitted a proposal to the U.S. Department of Education Institute of Education Sciences competition for a National R+D Center on AI in Education."

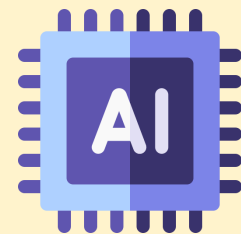
Prof. Joshua Wilson (Education)

Through the center's undergraduate research program, the AICoE is providing UD CISC undergraduate students the opportunity to gain research experience in AI applications through projects in domain sciences.

AICoE Affiliated Faculty—Activities

Prof. Leila Barmaki (Computer & Information Sciences)

Paper titled, "Towards Anatomy Education with Generative AI-based Virtual Assistants in Immersive Virtual Reality Environments" won the honorable mention best paper award in IEEE AIxVR conference—Jan 2024. [Link to paper](#)



Prof. Rodrigo Vargas (Plant and Soil Sciences)

A postdoc in this group had a recently published paper with Computers & Geoscience titled, "An Auto-correlated condition Latin Hypercube Method for Temporal or Spatial Sampling and Predictions." [Link to paper](#)

Prof. Cencheng Shen (Applied Economics and Statistics)

Paper published to IEEE Transactions on Network Science and Engineering, "Discovering Communication Pattern Shifts in Large-Scale Labelled Networks Using Encoder Embedding and Vertex Dynamics." [Link to paper](#)

Looking to the Future

NSF AI Institute Proposal: Theme 3: Strengthening AI

The center Co-Directors are both on the leadership team of this proposal submission, lead by PI Cathy Wu of DSI at UD.

NSF SCIFE Proposal

Co-Director Sunita Chandrasekaran is the PI of this SCIFE proposal, which is under review, aiming to bring Research Software Engineer (RSE) positions to UD to aid in the computational aspect of domain research.

Stay tuned for info on an upcoming 2024 Hackathon!

Activity Timeline

Aug 2022

The AICoE launched within the University of Delaware

First round of center seed funding announced

"Machine Learning for Computational LiDAR Imaging in Earth Science"

Prof. Gonzalo Arce, Prof. Rodrigo Vargas



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

Prof. Xi Peng, Prof. Arthur Trembanis



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

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

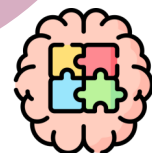


"Transformers for Socioemotional Behavior Assessment of children with Autism"

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

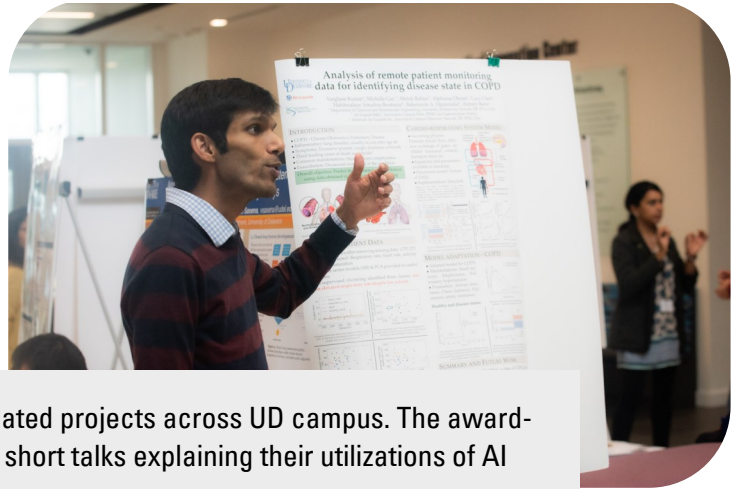
"Predicting After-effects of ExoSkeleton-assisted Gait Training to Inform Human-in-the-loop Control Optimization"

Prof. Fabrizio Sergi, Prof. Austin Brockmeier



Jan 2023

First AICoE Workshop

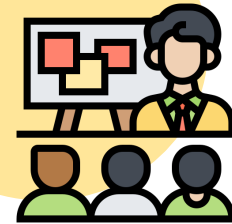


The workshop aimed to highlight the various AI-related projects across UD campus. The award-ees of the first AICoE seed funding round provided short talks explaining their utilizations of AI across disciplines.

Industry panelists from Microsoft, NVIDIA, 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 AICoE Postdoctoral Researcher Pinar Kullu that explored machine learning workflow.

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 way AI is used across the state. Speaking from an educational perspective, Kathy highlighted the demand for AI education in the workforce, starting that students who study AI are getting hired soon after entering the job market.

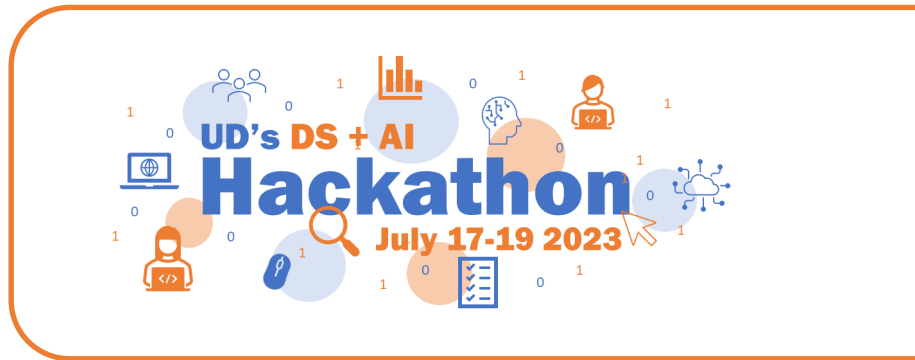
Jun 2023

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.

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



Predictive Models



Human-Computer Interaction



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)

DS+AI Hackathon Case Studies

Team Name	Affiliation of Domain Scientist	Area of Focus
AI4Seafloor	Dept. of Computer and Information Sciences, UD	Underwater Analysis, AI, Machine Learning
Chat Masters	Dept. of Computer and Information Sciences, UD	Social, Human-Computer Interaction, AI
Chemours Innovators	Chemours	Hydrogen Fuel Cell, Statistical Analysis
FMC Data Gurus	FMC Corporation	Chemistry, Machine Learning
Healthclaim Heros	Community Health Options	Health, Machine Learning
Kendal Transformers	Kendal Corporation	Health Services, Data Visualization, Statistical Analysis
Medical Marauders	Data Science Institute, UD	Health, Predictive Models
Mindset Miners	Dept. of Computer and Information Sciences, UD	Mental Health, Data Visualization/Formatting
Rain Makers	Dept. of Geography and Spatial Sciences, UD	Climate, Hydrology, AI, Machine Learning
Bug Busters	Dept. of Computer and Information Sciences, UD	Natural Language Processing, Deep Learning
The Visionaries	Dept. of Biological Sciences, UD	Biology, Data Formatting/Linkage, Visualization

Thank you to the DS+AI Hackathon Sponsors!

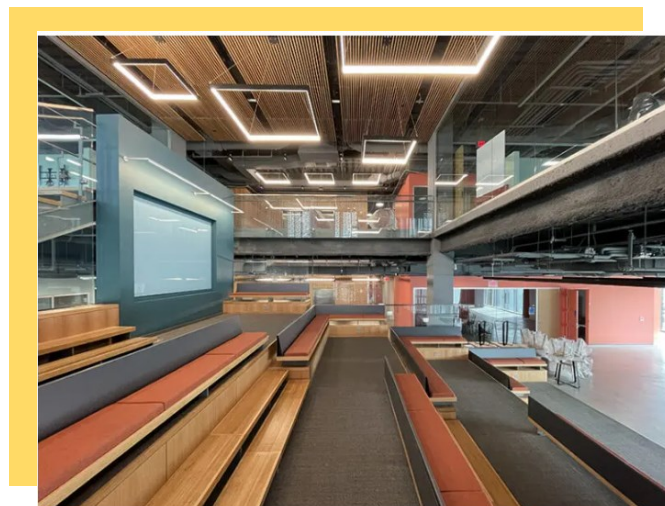


Aug 2023

New location!



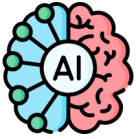
The center moved locations from South Main Street to the brand new Fintech Innovation Hub (591 Collaboration Way) on STAR campus. Situated on the 4th floor, the AICoE is in a fantastic location for collaboration with Engineering and Lerner faculty, as well as industry folks in the Fintech building.



Aug 2023

Artificial Intelligence Graduate Certificate

Starting Fall 2023, the AI Certificate is available for enrollment. The 9 credit program provides students with the necessary tools to build and train AI systems in order to be competitive in the job market.



Dec 2023

Seed Funding Round 2 Awardees Announced



“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-Hian Hsu (Tom),

“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

“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

Meet the AICoE 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



302-831-8841