



COMPUTER SCIENCE

NEWSLETTER



Dr. Lan Wang
Professor and Chair

CHAIR'S MESSAGE

Despite the challenges brought by the COVID-19 pandemic over the past year, the Department has continued to flourish. We smoothly transitioned our course offerings into an online format and welcomed three new research faculty, including our second chair of excellence. Our faculty has maintained recognition on the national and international stage with an impressive slew of new research grants. These projects represent not only our historical strengths in areas such as mobile health and cybersecurity, but also new steps into computer science education. I am proud of the resilience shown by our faculty, staff and students as we adapt to unprecedented circumstances.

WELCOME NEW FACULTY



Christos Papadopoulos joined the Computer Science (CS) faculty in fall 2020 as the Sparks Family Chair of Excellence in Computer Science. Previously, he was an assistant professor at the University of Southern California and a professor at Colorado State University. His research interests include network and cyber-physical systems security, global internet measurements, information-centric networks and smart and autonomous systems.

From 2018-20, he was a program manager at the Department of Homeland Security Science and Technology Directorate, where he managed projects on cyber-physical systems security, including industrial control systems, law enforcement and automotive cybersecurity.



Dr. Weizi Li joined the CS faculty as a tenure-track assistant professor in fall 2020.

Before joining, he was a Michael Hammer Postdoctoral Fellow at the Massachusetts Institute of Technology (MIT). He received his PhD from the University of North

Carolina at Chapel Hill. Li is currently working

on intelligent transportation systems, multi-agent simulation, virtual environments, machine learning and robotics.



Dr. Xiaolei Huang joined the CS faculty as a tenure-track assistant professor

in spring 2021. He obtained his PhD in Information Science from the University of Colorado, Boulder. During his PhD, he was a visiting scholar at

Johns Hopkins University. He obtained

his MSc and BEng degrees from the Chinese Academy of Sciences and Central China Normal University, respectively. His research is in natural language processing and machine learning, with applications in public health.

NEW GRANT FUNDING



The department was awarded a new \$299,333 grant from the National Science Foundation for “Improving the Quality of Teaching Assistant Feedback to Undergraduate Students in Introductory Computer Science Courses.” The three-year project will be led by PI **Dr. Amy Cook**, alongside co-PIs **Dr. Vinhthuy Phan** and **Dr. Alistair Windsor** (Mathematical Sciences).

Deepak Venugopal (PI) and **Dr. Vasile Rus** (co-PI) were awarded a \$413K grant from the National Science Foundation entitled “Investigating Techniques that Couple Markov Logic and Deep Learning with Applications to Discovering Strategies to Improve STEM Learning.” This three-year project will combine the techniques of Deep Neural Networks (DNNs) with Markov Logic Networks (MLNs) to address individual shortcomings of those approaches when used by themselves.



Professor and chair, **Dr. Lan Wang**, is leading the new mGuard project as PI, with co-PIs **Dr. Santosh Kumar** and **Dr. Lixia Zhang** from UCLA. initiative to focus on improving the efficiency of access control to privacy-sensitive user information, and supporting real-time retrieval and processing of sensor data. mGuard is supported by a two-year, \$825K grant from the National Science Foundation.

The NIH awarded a \$5.9 million grant for establishing the mHealth Center for Discovery, Optimization and Translation of Temporally-Precise Interventions (mDOT). mDOT will be headquartered at the MD2K Center of Excellence at the University of Memphis, under the direction of Kumar.

The multidisciplinary mDOT team consists of leading researchers in artificial intelligence, mobile computing, wearable sensors, privacy, and precision medicine from the University of Memphis (lead), Harvard University, Georgia Institute of Technology, Ohio State University, University of Massachusetts-Amherst, University of

California at Los Angeles and University of California at San Francisco.

A joint effort of Engineering Technology and Computer Science was awarded a \$318K grant from the Department of Defense to enhance the ROTC curriculum, with the goal of developing students capable of effectively conducting cybersecurity research. The project will be led by PI **Dr. James McGinnis** (Engineering Technology), and co-PI **Dr. Dipankar Dasgupta**, Hill Professor in Cybersecurity, both of whom are directors of the Center for Information Assurance. This grant is a part of the center’s mission on education and outreach in cybersecurity.

FACULTY ACCOLADES



Professor Dipankar Dasgupta, Hill Professor of Cybersecurity and director of the Center for Information Assurance, was honored by the Greater Memphis IT Council at its annual INNOVATE IT conference. The event, held virtually on Oct. 8, included a live poll that asked participants to select the top

innovation in entrepreneurship. Dasgupta’s patent for adaptive multi-factor authentication was ranked No. 1.

Earlier in 2020, Dasgupta was awarded another U.S. patent, no. 10,671,747 for “Multi-user permission strategy to access sensitive information.” The patent was filed jointly with

fellow researchers **Arunava Roy** and **Debasis Ghosh**.

Dasgupta gave a presentation at the IEEE World Congress on Computational Intelligence (WCCI) entitled “AI Is Not Magic—It Is Computational Logic” on July 21, 2020. He is also a taskforce member on secure learning with the IEEE Computational Intelligence Society.

Dr. Deepak Venugopal received the Fall 2020 College of Arts and Sciences Early Career Research Award from the University of Memphis.

Dr. Lan Wang, department chair, received the Fall 2020 College of Arts and Sciences Distinguished Research Award from the University of Memphis.



Dr. Thomas Watson received a two-year UMRF Ventures Professorship for his recent research successes, particularly his NSF CAREER award.

STUDENT AND ALUMNI NEWS

PhD student **Subash Poudyal** presented research at two events:

- S. Poudyal and D. Dasgupta, "AI-Powered Ransomware Detection Framework, IEEE Symposium Series on Computational Intelligence (SSCI)," Canberra, Australia, Dec. 1-4, 2020
- S. Poudyal and D. Dasgupta, "AI Powered Ransomware Detection Tool," Poster Session, CAE in Cybersecurity Symposium, Nov. 19-20, 2020

PhD student **Kishor Datta Gupta** presented research at two events:

- K. D. Gupta, D. Dasgupta, and Z. Akhtar, "Adversarial Input Detection Using Image Processing Techniques (IPT)," 11th Annual IEEE Ubiquitous Computing, Electronics & Mobile Communication Conference (UEMCON), New York City, Oct. 28-31, 2020
- K. D. Gupta, D. Dasgupta, and Z. Akhtar, "Applicability Issues of Evasion-Based Adversarial Attacks and Mitigation Techniques," IEEE Symposium Series on Computational Intelligence (SSCI), Canberra, Australia, Dec. 1-4, 2020

PhD student **Soujanya Chatterjee** received first place in the math and computer science category at the UofM's 2020 Student Research Forum, which was held online. Soujanya's project, entitled "SmokingOpp: Detecting the Smoking 'Opportunity' Context Using Mobile Sensor," was also accepted for presentation at the ACM UbiComp 2020 conference.

MS student **Shima Azzizadeh-Roodpish**'s research with Dr. Max Garzon led to a manuscript, "Classifying Single Nucleotide Polymorphisms in Humans," under review with Springer-Verlag's Molecular Genomics and Genetics Journal.

Nazir Saleheen, who completed his PhD in Spring 2020 under Dr. Santosh Kumar, has joined Google.

Dr. Sarah Lee (PhD '11) was named director of the School of Computing Sciences and Computer Engineering at the University of Southern Mississippi starting fall 2020. Lee completed her doctoral work in Computer Science with Dr. Sajjan Shiva.



Mahbub Rahman (PhD '16) received the Industry Track Best Paper Award at the IEEE PerCom 2020 conference. He completed his doctoral work with Dr. Santosh Kumar and is currently working as a researcher at Samsung Research America's Digital Health Lab. The awarded paper is based on the lab's lung health project, where the team is developing innovative

technologies to help patients with chronic respiratory diseases such as chronic obstructive pulmonary disease (COPD) or asthma.



MD2K RESEARCHERS LAUNCH APP FOR PERSONAL TRACKING OF SOCIAL DISTANCING

Researchers at the MD2K Center of Excellence, headquartered at the UofM and under the direction of Computer Science Dr. Santosh Kumar, announced the launch of a free mobile app called mContain in April 2020 to help track social distancing during the COVID-19 outbreak to reduce community transmission. mContain uses location and Bluetooth technologies in smartphones to detect proximity encounters (within six feet for several minutes) with other app users. Similar to a step count, the app counts and displays the number of daily proximity encounters with other app users. To reduce the chances of entering crowded places, the app displays the level of crowding at busy places on a map. If a user and their COVID-19 test provider both agree to share the results of their test, the app can notify other users about possible exposures to COVID-19.

DATA SCIENCE IN PYTHON WORKSHOPS

Since 2016, the Department has held a regular series of workshops on using Python in data science, aimed at professional clients. These workshops are typically offered in sets of two: an introductory session on Python programming and data analytics and a follow-up advanced session on data science and machine learning.

The tentative spring 2021 workshop dates are Friday-Saturday, May 7-8 for the intro session and Friday-Saturday, May 14-15 for the advanced session. Like the fall 2020 workshops, these will be held virtually. Special student rates are available. For details and to register, please visit memphis.edu/cs/outreach/ds_workshops.php

2020 COMPUTER SCIENCE GRADUATES

Doctor of Philosophy

Faisal Alsubaei

(Advisor: Dr. Sajjan Shiva)

Thesis: "Security Assessment Framework for the Internet of Medical Things Solutions"

MdMaminur Islam

(Advisor: Dr.

Deepak Venugopal)

Thesis: "Advances in Improving Scalability and Accuracy of MLNS using Symmetries"

Nazir Saleheen

(Advisor: Dr. Santosh Kumar)

Thesis: "Behavioral Privacy Risks and Mitigation

Approaches in Sharing of Wearable Inertial Sensor Data"

Quang M Tran

(Advisor: Dr. Vinhthuy Phan)

Thesis: "Algorithmic Methods for Large-scale Genomic and Metagenomic Data Analysis"

Master of Science

Shima Azizzadeh Roodpish

(Advisor: Dr. Max Garzon)

Kranthi Battu

(Advisor: Dr. Xiaofei Zhang)

Felipe De Oliveira

(Advisor: Dr. Vinhthuy Phan)

Senjuti Dutta

(Advisor: Dr. Kan Yang)

Thesis: "Enabling Efficient and Privacy-Preserving Task Matching For Cloud-Based Crowdsourcing"

Laqin Fan

(Advisor: Dr. Lan Wang)

Thesis: "Secure Sharing of Spatio-Temporal Data through Name-based Access Control"

Namita Fnu

(Advisor: Dr. Sajjan Shiva)

Anik Khan

(Advisor: Dr. Nirman Kumar)

Ashok Kumar Gadde

(Advisor: Dr. Xiaofei Zhang)

Naeem Khoshnevis

(Advisor: Dr.

Deepak Venugopal)

Varun S Negandhi

(Advisor: Dr.

Deepak Venugopal)

David C Rosenberg

(Advisor: Dr. Amy Cook)

Sajib Sen

(Advisor: Dr.

Dipankar Dasgupta)

Utsav Shrestha

(Advisor: Dr. Nirman Kumar)

Thesis: "Quantitative Analysis and Monte Carlo Modeling of Fat-Mediated MRI Relaxation"

Neha Sinha

(Advisor: Dr. Xiaofei Zhang)

William A Smith

(Advisor: Dr. Amy Cook)

Yu Sun

(Advisor: Dr. Xiaofei Zhang)

Bachelor of Science

Robert W Aquadro

Michel D Arias Ayala

James P Barry

Benjamin M Borstad

Hunter C Brickeen

Isaiah C Bryant

Daniel L Chamberlin

John M Cortes Perez

Madeline P Cychowski

Neil R Damaraju

Phuong K Do

Henry M Fyfe

William T Hagan

Taylor S Hendrickson

Destinee A Higgs

Mykaila K Johnson

Ryan E Johnson

Sohail Khalid

Grace N Kigaita

Alexander W Lane

Adam T Loshier

Travis O Malmquist

Mark A Mills

Christopher S Moore

Kevin E Murphy

Carl M Myers

Liathe H Najdawi

Logan W Newman

Minh Thi Thanh Ngo

Jie Ni

Tyrone L Parker

Smit K Patel

Christopher D Peete

Nicolas E Pizarro

Michael A Porter

Jacob K Poyner

Nicholas J Roberts

Stephen P Rogers

John M Salajka

Brandon D Smith

John B Stevenson

John R Suleiman

Jared S Thomas

Vinh J Tran

Eriel L Traywick

Timothy S Wallin

Brian E Watkins

Joshua White

Ryan P Wickman

James S Willson

Hunter B Woodward

Benjamin Young

2020 Computer Science Internships

Kranthi Battu

FedEx Services

Jeremy Clark

FedEx Services

Catherine Coleman

Lokion Interactive

Namita Fnu

FedEx Services

Taylor Hendrickson

UMRF Ventures, Inc.

Michael Methvin

Center for

Earthquake Research

and Information (CERI)

Visualization Laboratory

Mark Mills

Docazoo LLC

Christopher Nguyen

Edesia

Sahil Nokhwal

Intel

Tyrone Parker

Baptist Memorial Healthcare

Rabie Mohamed Rabie

Intel

Nicholas Roberts

FedEx

Jonathan Snider

FedEx Services

Utsav Shrestha

UMRF Ventures, Inc.

SUPPORTING THE DEPARTMENT

The department has been fortunate to receive several generous gifts from donors. Gifts can endow professorships, scholarships, fellowships, classrooms, and labs for our students. They can also be used to help defray travel expenses for conferences to present research papers, as well as many other activities that are extremely meaningful to our students and the Memphis community.

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