

COMPUTER SCIENCE

OLD DOMINION UNIVERSITY



A DEPARTMENT OF GROW

The Department of Computer Science at Old Dominion University is seeking multiple full-time tenure-track faculty members with expertise in interdisciplinary areas of big data, machine learning and high performance scientific computing, cybersecurity, and medical image computing. Outstanding candidates in other areas of computer science will also be considered. The appointment is expected to be made at the Assistant Professor rank with an anticipated start date of July 2019. At the time of appointment, the candidate must have a PhD or equivalent in computer science or related discipline. Exceptional candidates with established research and active funding may be considered at the Associate Professor rank.

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MESSAGE FROM THE CHAIR



Welcome to the Spring Edition of the Department of Computer Science's biannual newsletter. This is our third edition. We welcome your feedback.

Our first ODU CS Alumni meet was held on November 8, 2018 at the O'Connor Brewing Co. in Norfolk. It was an exciting event for both the alumni and the faculty. We get to meet many of our past students. We saw some of them after nearly 30 years. In this issue, we share several of the photos taken at the event. You may find yourself (if you have attended) or find a friend. We plan to have the next alumni meet in September 2019 in Norfolk. Watch out for an invite from the ODU Alumni Association. Our recent alumni,

Mr. Sai Ratnakar Nidumolu has also filed an application to start a ODU CS Alumni Chapter. The application is currently being reviewed by the Alumni Board. We will keep you updated about its progress.

With help from Ms. Janet Brunelle, we were able to collect some photos of some of our social gatherings from the past, probably 25 years ago. This newsletter has some of these photos. This represents a snapshot into our past faculty members. Some of you may remember them.

As we continue to grow in enrollments, we are also adding new faculty members. This Fall, we are joined by Dr. Sampath Jayarathna, Dr. Jiangwen Sun, Dr. Jian Wu, and Ms. Susan Zehra. We welcome them into the CS family.

We are also pleased to announce the promotion of Dr. Michele Weigle to professor effective Fall 2019. Mr. Thomas Kennedy, our alumni and our faculty member, had received the "Most Inspiring Faculty" award at the Fall 2018 Graduation ceremony. We congratulate both of them for their achievements.

In honor of Late Dr. Hussein Abdel-Wahab, who had an untimely death in December 2016, ODU's Information Technology Services (ITS) dedicated their newest high-performance cluster to him. Dr. Abdel-Wahab was with the department since 1980 and is fondly remembered by almost all our alumni for his systems programming and networking courses. He also served as a GPD for a long time and recruited several successful PhD students.

In this issue, we feature two current PhD student work. Richard pates and Justin Whitlock have joined our PhD program recently and provide a glimpse into their work.

A group of our faculty, Dr. Kurt maly, Dr. Shubham Jain, and Mr. Ajay Gupta, in collaboration with several other medical researchers, are actively working on a project to improve the quality of life in dementia patients. This work definitely has an immediate social value as the number of dementia patients in the older population in US is steadily growing.

On the student scholarship front, Mr. Travis Priest, one of our of our alumni from Ajay Gupta's systems group, has started a new \$4,000/year "Travis Priest family Endowment Scholarship" to a student in our systems group. We sincerely appreciate Travis' generosity. If any of you have plans to establish such an endowed scholarship, either as individuals or as a group, please contact me at mukka@cs.odu.edu.

We would like to hear from our alumni and share their progress in our future newsletters. Since we are also in the process of building our alumni database, please take time to submit your information through the link provided on the last page of this issue.

STUDENT RESEARCH

SUPPORTING FUTURE RESEARCH IN THE PHD PROGRAM

BY: RICHARD PATES
MS STUDENT

Dr. Ravi Mukkamala and Dr. Cong Wang are jointly advising me as I enter the PhD program through the Computer Science Department this Spring semester in 2019. Dr. Mukkamala advised me on taking the High Performance Computing and Big Data course and the Cryptocurrencies: Fundamentals, Technologies and Economics. Dr. Aftab Ahmad also supported my decision to enter the PhD program providing a reference letter.

After discussing possible research topics with Dr. Wang, the decision to pursue researching Neural Network Technology (NNT) was clear. We discussed working through the Old Dominion University (ODU) Research Computing Documentation after getting a High Performance Computing (HPC) account to access the Turing cluster with a special interest in Graphics Processing Unit (GPU) and CUDA Programming using NVIDIA. We also discussed utilizing the Ubuntu Operating System (OS) and installing Tensor Flow with GPU and Keras. This Winter break I was able to get an HPC account created to access the Turing cluster and work through the ODU Research Computing Documentation.

Overall, some modules required an updated license and some modules were not available. Success was obtained in submitting a very simple CUDA Program and MPI job on the Turing cluster to understand GPU sharing. Submitting a slurm job utilizing the correct process thread configuration was also very useful to learn.

Ultimately, this winter break a dual boot OS was configured on a Windows 10 64-Bit Laptop as the host with a i7-6500U Processor with NVIDIA GeForce 940M GPU. The host OS, Windows 10 was configured with Anaconda + TensorFlow and Spyder as the Integrated Development Environment (IDE) for Python programming. The second OS is Ubuntu 18.04.1 configured with TensorFlow and access to the NVIDIA GeForce GPU for CUDA Programming. In anticipation to have a virtual environment readily available I configured VMware Workstation Pro 15 with two VM's. One with Ubuntu 18.04.1 LTS OS and TensorFlow supporting CPU processing. The other OS with Windows 10 Home 64-Bit. I also learned how to remotely access ODU's computer lab with VMware Horizon HTML. While installing the Ubuntu OS on the VM with TensorFlow, GPU was not able to execute even with Virtualization Technology enabled in the Windows 10 BIOS host and the Ubuntu OS configured with Virtualization Engine Virtualize Intel VT-x/EPT or AMD-V/RVI. I'm sure I will learn much more in the High Performance Computing and Big Data class this semester.

STUDENT RESEARCH

"GUTEN TAG" FROM MUNICH

JUSTIN WHITLOCK
PHD STUDENT

With the support of the Department of Computer Science at Old Dominion University, I was able to travel to Munich Germany for MobiSys 2018. This conference gathers a broad range of researchers and industry specialists working with mobile systems in the field of computer science.

At WearSys, one of the associated workshops for MobiSys, I gave a presentation on my work with Orkun Krand and Dr. Shubham Jain applying activity recognition to the segmentation of multi-sport activities. This research would allow athletes to record events such as the triathlon on a smart device without having to interact with the device during the competition by segmenting each portion of the race automatically. They would then receive the same metrics as current manual segmentation methods. In presenting my research, I was able to connect with and receive feedback from leaders in my field, as well as fellow PhD students.

The main conference had a number of keynotes from some of the most influential researchers in computer science. The presentations and posters ranged from binary neural networks for mobile devices to a virtual reality system designed to improve empathy for patients with degenerative eye conditions. There was also a great many discussions concerning edge computing, a fairly recent trend which may have a huge impact on cloud computing and how mobile systems interact with each other and with their users. One of the presentations concerning edge computing involved data migration between nodes as a user moves through the network. In addition to computer scientists, there were a few attendees who work in related fields, such as materials science, where they are developing smart materials with integrated wearable sensors. The conference also gave me the opportunity to meet other researchers who share similar research interests. One smart fabric researcher, Kaspar Jansen from TU Delft, has worked with flexible capacitive sensors and accelerometers, applying them to activity recognition for athletes. I also met Katryn Hansel from Oxford, currently working at Nokia/Bell labs at Cambridge. Katryn studies human interactions and behaviors. Her work applies to my own, since activity segmentation on real world data requires a certain level of understanding of human habits and behaviors. I look forward to collaborating with some of the researchers that I met, which would not be possible if I had not attended MobiSys. Attending MobiSys was an incredible opportunity, both for my education and my career. I am grateful for the support of the Department of Computer Science in making this invaluable experience possible.

CONGRATULATIONS

NEHA NIPHADKAR
MS STUDENT

Neha has been accepted to attend the CRA-W Cohort Workshop in Chicago, Illinois. The conference will take place in April 2019. Over the years the Department has had number of students accepted to attend the conference from both the MS and PhD programs.

ALUMNI NEWS

FIRST CS ALUMNI EVENT

IN HAMPTON ROADS

November 8, 2018 was a night in Hampton Roads to remember. We had over 200 alumnus and guests in attendance along with numerous members of our current and past faculty.

Our next alumni event will be in early September of 2019. Please be on the look out for the announcement in July.





FACULTY NEWS

PROMOTION

MICHELE WEIGLE
PROFESSOR
GRADUATE PROGRAM DIRECTOR



Dr. Michele C. Weigle is a Professor of Computer Science at Old Dominion University. Her research interests include web science, digital preservation, and information visualization. Her research in web archiving includes developing tools for personal web archiving, improving access to web archives for general users and researchers, and applying information visualization to web archives. She has published over 100 articles in peer-reviewed conferences and journals and has served as PI or Co-PI on external research grants totaling over \$3.3M from the National Science Foundation, the National Endowment for the Humanities, the Institute of Museum and Library Services, and the Andrew W. Mellon Foundation. She is currently serving on the editorial boards of the Journal of the Association for Information Science and Technology (JASIST) and the International Journal on Digital Libraries (IJDL). Dr. Weigle received her PhD in computer science from the University of North Carolina in 2003. From 2004-2006, she was an Assistant Professor in the Department of Computer Science at Clemson University. She joined ODU in 2006.

AWARDS



THOMAS KENNEDY
LECTURER

Thomas J. Kennedy earned his BSCS and MSCS from ODU. Since 2014, he has taught various courses, including Object Oriented Programming (C++, Java and Python), Computational Methods, Software Engineering, and Professional Workforce Development. Interests include parallel computing, numerical methods, and operating systems. Thomas, in December 2018, received the Most Inspiring Faculty Award.

NEW FACULTY



SAMPATH JAYARATHNA

Assistant Professor Data Science

Dr. Sampath Jayarathna is an Assistant Professor of Computer Science at Old Dominion University, where he is associated with Web Science and Digital Libraries (WS-DL) research group. Prior to joining ODU in 2018, he was an Assistant Professor at California State Polytechnic University Pomona. Dr. Jayarathna earned a PhD in Computer science from the Texas A&M University College Station in 2016. His research interest includes, information retrieval, data science eye tracking, attention, working memory, and executive function. Dr. Jayarathna has published in venues such as CIKM, CHIIR, JCDL, ETRA, Big Data, ACM TAP and IEEE TBE. He received best student paper nomination at JCDL 2015. His service includes, teaching Python to incarcerated men at Norfolk City Jail, chair/co-chair of organizing committees at ACM CHIIR, JCDL, IRI conferences. Dr. Jayarathna is a member of ACM, IEEE and Sigma XI.

JIANGWEN SUN

Assistant Professor Data Science

Jiangwen Sun received his Doctorate Degree in Computer Science & Engineering from University of Connecticut, Master's Degree in Computer Engineering from Nanjing University and Bachelor's Degree in Medicine from Second Military Medical University.



He mainly works on machine learning approaches for the study of human disease by systemically interrogating data from multiple dimensions of life, such as phenome, genome, transcriptome, epigenome, exposome, etc. More generally, he has broad interest in various machine learning and data mining techniques, particularly those that are applicable to problems in areas related to medicine and health, such as biology, drug discovery, image analysis and social networks. The overall goal of his research is to improve the precision of medicine and advance its automation.

He has (co-)authored six papers in leading international machine learning and data mining conferences (such as ICML, SIGKDD and NIPS), five papers in the premier research conference in bioinformatics and biomedicine (BIBM) and 12 peer-reviewed journal articles. His work has covered a wide range of machine learning topics, including but not limited to: sparse learning, matrix factorization, multi-view learning, multi-task learning, predictive modeling, matrix completion, multi-objective programming, general optimization problem modeling and deep learning. He has developed advanced algorithms to address several computational challenges in the study of human disease and related biology, including disease subtyping, outcome prediction based on temporal measurement, conservative gene coregulatory module finding and phenotype imputation..



JIAN WU

Assistant Professor
Data Science

Dr. Jian Wu is an assistant professor in the Department of Computer Science. He is in the Web Science Digital Library Group (WS-DL). Before joining ODU, Dr. Wu was an assistant teaching professor in the College of Information Sciences and Technology at the Pennsylvania State University (Penn State). Dr. Wu was working with Dr. C. Lee Giles on the CiteSeerX project as a tech leader since 2013. Dr. Wu's research interests include text mining, digital library, and search engines. He uses Machine Learning, Deep Learning, and Natural Language Processing techniques to mine knowledge from scholarly big data. He has published 30+ peer-reviewed papers in ACM, IEEE, and AAAI conferences and magazines, receiving best papers and nominations, in addition to articles published early in astrophysical journals. Dr. Wu made critical improvements to the architecture, web crawling, and extraction modules of CiteSeerX, increasing the collection from 3 million to 10 million by 2017. He was rated the best reviewer in JCDL 2018.

NEW FACULTY



SUSAN ZEHRA

Lecturer

Mrs. Susan Zehra is a full-time lecturer in the Computer Science (CS) department at Old Dominion University (ODU), Norfolk, VA. Previously, she served as an instructor in the CS department of Hampton University, Hampton, Virginia for five years. Susan has also served as an adjunct faculty at Tidewater Community College and Thomas Nelson Community College where she taught object-oriented programming and CS fundamentals. She is currently pursuing PhD in CS at ODU with a focus on autonomous vehicles. She has done MS in Electronics Engineering from Norfolk State University, Norfolk, VA, and BS in Electrical Engineering from Jamia Millia Islamia, New Delhi India. She is a certified CCNA specialist in Network and Routing Protocols. Susan has served on the editorial board and review committees of several journals and books. Her research interests are related to embedded systems, sensor networks, autonomous vehicles, cybersecurity, and information assurance.

FEATURED RESEARCH

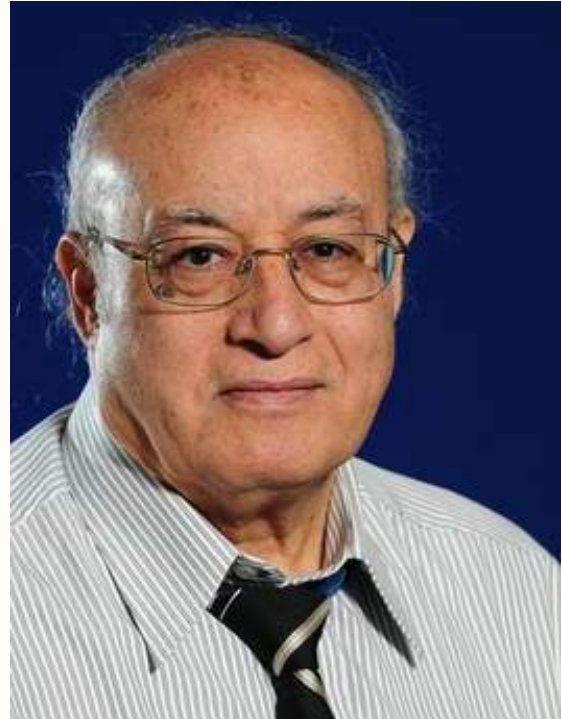
HIGH PERFORMANCE COMPUTING CLUSTER IS DEDICATED TO LONG-TIME ODU COMPUTER SCIENCE FACULTY MEMBER

BY RUSTY WATERFIELD
ASSOCIATE VICE PRESIDENT FOR UNIVERSITY
SERVICES & CHIEF INFORMATION OFFICER
INFORMATION TECHNOLOGY SERVICES

In recognition of his passion for education and dedication to computer science at ODU, a new HPC cluster is being named in honor of beloved professor Dr. Hussein Abdel-Wahab. Dr. Wahab contributed to the success of countless students throughout his many years at ODU before his untimely passing in December 2016.

Dr. Wahab joined the computer science department in 1980, where he was instrumental in developing the BS, MS and PhD programs and served as graduate program director for 15 years. He developed and taught 25 different courses during his time at ODU.

He was an expert in communication networks, security and systems. Abdel-Wahab spent countless hours helping graduate and undergraduate students with system-related issues in their courses and projects.



**"Hussein had a passion
for teaching and always
put students' interests
in front of his own,"**

said Ravi Mukkamala, chair of the
Department of Computer Science.

Ajay Gupta, director of computing resources in the department, said Abdel-Wahab dedicated his life to teaching computer science. "He was a beloved teacher, who was highly respected by both his colleagues and students alike."

IMPROVING QUALITY OF LIFE IN DEMENTIA PATIENTS

KURT MALY, KAUFMAN PROFESSOR AND EMINENT SCHOLAR EMERITUS
SHUBHAM JAIN, ASSISTANT PROFESSOR
AJAY GUPTA, DIRECTOR COMPUTER RESOURCES

In the U.S., various forms of dementia affect over 5 million people and these numbers are expected to climb to 7 million by the year 2025. Individuals with dementia often go through significant behavioral and psychological symptoms of dementia (BPSD), which can be challenging for both family caregivers and paid caregivers. One of the most common types of BSPDs is agitation with a prevalence of up to 87%. Agitation can lead to impaired daily functioning, prolongation of hospitalization, reduced time to institutionalization, and higher mortality.

Our collaborative team at ODU and EVMS is building technology to not only detect but also predict agitation in patients with dementia. Over the years, use of smart devices and wearable sensors has increased dramatically in the field of healthcare.

Our goal is to improve the quality of life of persons with dementia (PWD) by using a system of wearable sensors that will detect agitation early and intervene in an appropriate manner automatically to prevent full-blown manifestation. In our preliminary study reported in earlier papers, our software system and protocols are successful in detecting agitation in a set of patients with an accuracy between 60% to 85%.



Our multidisciplinary team consists of a sensor technology group from the Computer Science department and a patient care group from EVMS: Shubham Jain and Kurt Maly are experts in mobile sensing technology and focus on sensor data processing and statistical analysis. Ajay Gupta leads the team in system integration and testing. Christianne Nesbitt from School of Nursing at ODU is an expert in understanding and educating caregivers. From Eastern Virginia Medical School, Hamid Okhravi is a geriatric specialist who provides the clinical expertise in the team. He works with over one thousand individuals living with dementia and their caregivers in the Memory Consultation Clinic at EVMS. This work is dedicated entirely to members of our community.

BLAST FROM THE PAST

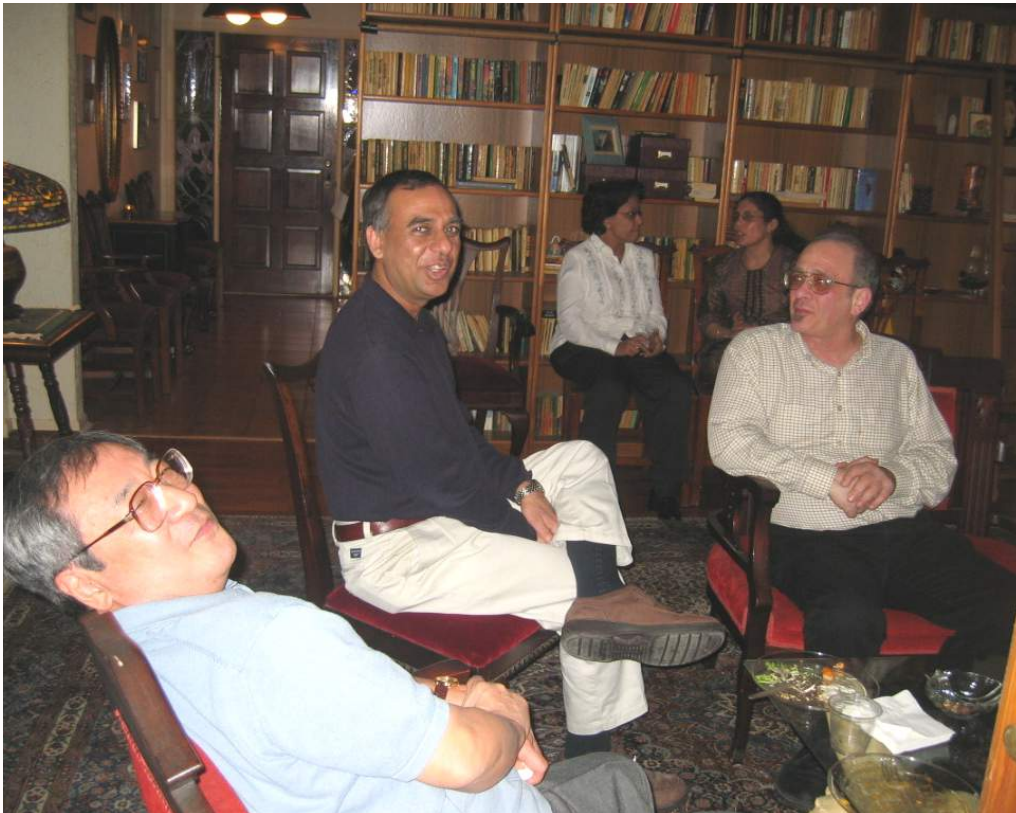
PICTURES BY: JANET BRUNELLE



BLAST FROM THE PAST

"WE WERE A FAMILY
OUTSIDE OF WORK."

- Phyllis Y. Woods
Secretary to the Chair
44 years of service AND counting...



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DR. RAVI MUKKAMALA, EDITOR INCHIEF
ARIEL STURTEVANT, EDITOR

