COMPUTER SCIENCE & ENGINEERING

UC San Diego

Message from the Chair

Sorin Lerner

Welcome to Spring quarter. Last week, we hosted the 4th Annual CSE Research Open House, which was our first large in-person event since fall 2021, and an incredible showcase for the research being conducted by CSE faculty and students.

Sameer Samat, vice president of Product Management at Google, received our Distinguished Alumni Award, and Chandra Krintz, Professor at UC Santa Barbara, gave the keynote address about her work on SmartFarm. Thank you to all who participated.

Our most recent Twitch conversation, with me, co-host Niema Moshiri and UCSD alum Mike Chi (PhD '11), CEO of RetroTINK, has now been posted for those who missed it live.

In other exciting news, our graduate program has been ranked #11 by *US News and World Report*, up from #16. This is a testament to the groundbreaking research and education at CSE, and the unwavering dedication of our faculty, staff and students.

As always, my virtual (and actual) door is open. Stop by.

Sorin Lerner, CSE Department Chair

Stay connected with CSE by following our Twitter, Facebook, LinkedIn and Instagram feeds. If you have news, story ideas or comments for our CSE Communications Team, please send them to cse-communications@eng.ucsd.edu.

CSE NEWS

Researchers Assemble the First Complete Human Genome

Two decades after the Human Genome Project produced a draft sequence, an international research team, including Pavel Pevzner and PhD student Andrey Bzikadze, has published the first complete genome. Six papers describing the project were published on April 1 in a special edition of the journal *Science*.

New, Highly Accurate Algorithm Scales Ability to Assemble Complete Genomes

In more genome assembly news, an international team led by CSE researchers has shown that a new genome assembly algorithm, called the La Jolla Assembler, vastly improves genome assembly, the process by which DNA snippets are arranged into complete genomes.

How Bacteria Can Fuel Low-Power Sensors

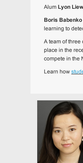
A collaborative team, including Pat Pannuto and PhD student Gabriel Marcano, have shown soil microbes can be harnessed to fuel low-power sensors. This opens new possibilities for microbial fuel cells, which can power soil hydration sensors and other devices.

Daniel Kane Takes on Intricate Puzzles

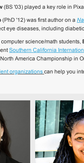
With joint appointments in the CSE and Mathematics departments, Associate Professor Daniel Kane straddles the line between both disciplines. But for Kane, computer science offers some unique opportunities.

CSE Rises in the Rankings

UC San Diego's graduate program in Computer Science and Engineering was recently ranked #11 in the *U.S. News and World Report* Graduate Program Rankings. The program was ranked 30th in 1994 and has since moved up 19 spaces.



Andrey Bzikadze



Pavel Pevzner

Pat Pannuto

NOTEWORTHY

Mihir Bellare has received another test of time award – the second in two years – from IACR for *Deterministic and Efficiently Searchable Encryption*. He was honored in 2021 for *New proofs for NMAC and HMAC: Security Without Collision-Resistance*.

Niema Moshiri contributed to a recent paper that traced the origins of SARS-CoV-2.

Rose Yu, Henrik Christensen and **Nikolay Atanasov** have received a Defense University Research Instrumentation Program (DURIP) award to create a GPU/CPU deep learning cluster that enables robotic deep learning in complex spatiotemporal environments.

A research team led by **Laurel Riek** has received a Department of Defense Multidisciplinary University Research Initiative (MURI) grant for Human Autonomy Teaming in Uncertain and Dynamic Environments (HUDDLE).

Laurel Riek and **Angelique Taylor** received the best paper award at the HRI Conference for *REGROUP: A Robot-Centric Group Detection and Tracking System*.

PhD candidate **Gatuam Akiwate** recently won the Applied Networking Research Prize for his work on *Risky BGPeers: Risks Derived from Registrar Name Management*.

Ndapa Nakashole has received a National Science Foundation Career Grant.

Shachar Lovett is giving a series of three Erdos Lectures in Discrete Mathematics and Theoretical Computer Science at The Hebrew University of Jerusalem.

The paper *Quantifying Nations' Exposure to Traffic Observation and Selective Tampering* from **Alexander Gamero-Garrido, Alex Snoeren** and others was recently awarded Best Dataset at the Passive and Active Measurement Conference.

Julian McAuley was recently featured in *The Guardian* in an article on TikTok (mis)information and the war in Ukraine.

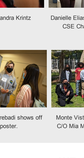
Alum **Lyon Liew** (BS '03) played a key role in Pixar's recent release, *Turning Red*.

Boris Babenko (PhD '12) was first author on a *Nature Biomedical Engineering* paper that used deep learning to detect eye diseases, including diabetic retinopathy.

A team of three computer science/math students, **Eric Ma, Chengsong Diao and Shuangmu Ha**, took third place in the recent Southern California International Collegiate Programming Contest. They will now compete in the North America Championship in Orlando.

Learn how student organizations can help you integrate into CSE life.

Rose Yu

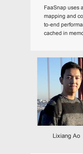


Angelique Taylor

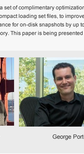
Ndapa Nakashole

RESEARCH OPEN HOUSE

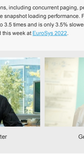
On March 30, CSE hosted its 4th annual CSE Research Open House. The day-long event highlighted CSE graduate studies, offered unique networking opportunities and illuminated the copious research being done at CSE. Many thanks to keynote speaker, UCSB Professor Chandra Krintz, and panelists to Google's VP of Product Management and Distinguished Alumni Award winner Sameer Samat (BS '00).



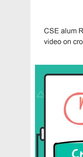
Keynote Chandra Krintz



Danielle Elias, Dean Tullsen and CSE Chair Sorin Lerner

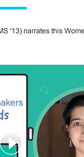


Patrick Paxson



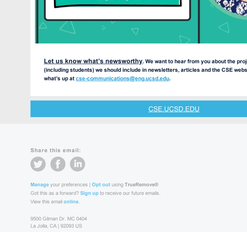
MaryAm Pouredadi shows off her poster.

Monte Vista High School AP Comp Sci C/O Mia Minnes and Rachael Wellisch



Alumni awardee Sameer Samat

WE ARE CSE



CENTER FOR NETWORKED SYSTEMS

Virtual Machine Snapshots with FaaSnap

Virtual machine (VM) snapshots are a promising way to solve the cold start problem in serverless computing (FaaS). Serverless platforms can avoid the slow VM booting and initialization by using on-disk snapshots. However, due to the speed requirements associated with guest memory accesses and the unpredictable nature of FaaS applications, loading snapshots to memory can be challenging.

Recently, PhD student Lixiang Ao, along with George Porter and Geoffrey Voelker, published *FaaSnap: FaaS Made Fast Using Snapshot-based VMs*, which tackles the snapshot loading problem.

FaaSnap uses a set of complimentary optimizations, including concurrent paging, per-region memory mapping and compact loading set files, to improve snapshot loading performance. FaaSnap improves end-to-end performance for on-disk snapshots by up to 3.5 times and is only 3.5% slower than snapshots cached in memory. This paper is being presented this week at EuroSys 2022.

Lixiang Ao

George Porter

Geoff Voelker

CSE VIDEO HIGHLIGHT

CSE alum Roshni Chandrashekhar (MS '13) narrates this Women Techmakers video on cross-account protection.

Let us know what's newsworthy. We want to hear from you about the projects and people (including students) we should include in newsletters, articles and the CSE website. Let us know what's up at cse-communications@eng.ucsd.edu.

CSE.UCSD.EDU