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## Computer Scientist and Mathematician Join CSE Faculty at UC San Diego

In the face of heavy enrollment and strong demand for computer science education, the Computer Science and Engineering (CSE) department at the University of California, San Diego is expanding its faculty. CSE Chair Rajesh Gupta recently announced two more new faculty hires in the department, indicating that there will also likely be more announcements to come. Following the recent hiring of lecturer Mia Minnes, CSE has recruited two assistant professors who will join the faculty as of July 1, 2014: mathematician and computer scientist Daniel M. Kane, and datacenter and networked systems expert George Porter.



*George Porter*

Porter is not a newcomer to CSE or UC San Diego (which may be why he opted to stay despite several competing offers). The former research scientist and associate director of the Center for Networked Systems (CNS) now becomes an assistant professor in the department, where he will continue his work at the intersection of computer networks and data-intensive computing. Porter will remain associate director of CNS. For most of his time at UCSD, Porter has also been a key player in the NSF-funded Center for Integrated Access Networks (CIAN). Since arriving on campus in 2009, Porter has been involved in a long series of industry grants as principal investigator or co-PI. These include projects funded by Cisco Systems, Google, Ericsson

and NetApp (a faculty fellowship in 2011). Porter also designed and built the Scalable Energy Efficient Datacenter (SEED) testbed, and he was a co-PI on the Mordia project, which developed a microsecond optical research datacenter interconnect architecture (with primary funding from Google). A team of CSE graduate students and Porter achieved world records

back-to-back in 2010 and '11 in the SortBenchmark.org competition. In 2010 they broke two records for highly efficient sorting, and the following year they came out on top in five categories.

Going forward, Porter is PI on a major project funded by NSF through mid-2016. The large-scale Networking Technology and Systems (NeTS) research project on “Hybrid Circuit/Packet Networking” is developing a hybrid switching paradigm that spans the gap between traditional circuit switching and full-fledged packet switching. “The hybrid model will allow us to achieve a level of performance and scale not previously attainable,” said Porter. “This will result in a hybrid switch whose optical switching capacity is orders of magnitude larger than the electrical packet switch, yet whose performance from an end-to-end perspective is largely indistinguishable from a giant (electrical) packet switch.” If successful, Porter and his co-PIs (CSE’s Alex Snoeren as well as ECE’s George Papen and Joseph Ford) will produce a system that stands to dramatically improve data center networks by increasing energy efficiency and significantly reducing operating costs.

Daniel Kane is moving to San Diego from Palo Alto, where he has been a postdoctoral researcher in the Department of Mathematics at Stanford University on an NSF Postdoctoral Research Fellowship. Kane will be based in CSE, but with a dual appointment in the Department of Mathematics. Prior to Stanford, he attended graduate school in mathematics at Harvard University (Ph.D. '11, MS '08). Before that, with a perfect GPA, Kane received two BS degrees at MIT in 2007, one in mathematics with computer science, the other in physics.



*Daniel M. Kane*

Kane has diverse research interests in mathematics and theoretical computer science, though most of his work fits into the broad categories of number theory, complexity theory or combinatorics. “My mathematics work has tended to focus on analytic number theory,” said Kane. “My computer science work has typically involved  $k$ -independence, polynomial threshold functions or derandomization.” In 2013, he received the Best Paper award at the Conference on Computational Complexity, and a decade earlier Kane – as a member of the USA team – won a gold medal at the International Mathematical Olympiad in 2002 and again in 2003.

Both Kane and Porter are members of the Association for Computing Machinery. Kane is also a member of the American Mathematical Society and the Mathematical Association of America. “George and Daniel are wonderful additions to the Computer Science and Engineering faculty,” says CSE chair Gupta. “We also owe a big thanks to our recruiting committee that continues to attract compelling talent to the department! And yes, I do look forward to repeating this sentence again this recruiting season!”

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