PROMOTION RECOMMENDATION
The University of Michigan
College of Engineering
Department of Electrical Engineering and Computer Science

Reetuparna Das, assistant professor of electrical engineering and computer science, Department of Electrical Engineering and Computer Science, College of Engineering, is recommended for promotion to associate professor of electrical engineering and computer science, with tenure, Department of Electrical Engineering and Computer Science, College of Engineering.

Academic Degrees:
Ph.D.   2010   Pennsylvania State University, Computer Science and Engineering, State College, PA
B.S.   2004   National Institute of Technology, Computer Science and Engineering, Rourkela, India

Professional Record:
2016 – Present   Assistant Professor, Department of Electrical Engineering and Computer Science, University of Michigan
2014 – 2015   Researcher in Residence, Center for Future Architectures Research, University of Michigan
2013 – 2013   Visiting Researcher, Microsoft Research, Redmond, WA
2011 – 2015   Assistant Research Scientist, Department of Electrical Engineering and Computer Science, University of Michigan
2010 – 2011   Research Scientist, Intel Labs, Santa Clara, OR

Summary of Evaluation:
Teaching: Professor Das has taught with distinction at both the undergraduate and graduate levels. At the undergraduate level in a core required course, Professor Das's course quality ratings range from the high 3s to high 4s, while instructor quality ratings are above 4.0 in all offerings since her first term. The graduate ratings are consistently high. She has co-developed a new upper-level elective on parallel programming GPUs in the current semester. Professor Das has co-advised two Ph.D. students to completion, and is currently the sole or co-advisor of five others. She has demonstrated success in mentoring PhD researchers with a consistent record of top-tier publications featuring her students as first authors. Students are universal in their praise for Professor Das in the classroom and as a research mentor. Several note her ability to explain complex topics, as well as her emphasis on developing the interests of all students.

Research: Professor Das's research addresses architecture at the end of Moore's Law, which over decades produced ever-decreasing feature sizes in silicon processors. Without such advances, improvements in performance must come from architectural designs targeting specific categories of computation, rather than relying on advances in general purpose architectures. She has pioneered in-memory computing, which is now considered one of the hottest topics in the architecture community. Surprisingly, in-memory computation can be accomplished with existing architectural infrastructure for certain classes of operations, providing substantial

performance improvement for common AI workloads. Similar techniques applied to resistive memories can provide arbitrary GPU computations at significantly improved performance. Professor Das has also developed custom architectures for genomic sequencing, providing orders-of-magnitude improvement in performance and, therefore, reduction in costs. This has led to a startup to commercialize the approach. Her work has been published in top-tier venues, and is receiving significant attention. Professor Das has been recognized with both an NSF CAREER award and a Sloan Fellowship. Her research program has attracted substantial funding, with more than $3M in support.

Recent and Significant Publications:
C. Eckert, X. Wang, J. Wang, A. Subramaniyan, R. Iyer, D. Sylvester, D. Blaauw, R. Das, "Neural Cache: In-Cache Acceleration of Deep Neural Networks," *45th Annual ACM/IEEE International Symposium on Computer Architecture (ISCA-45, '18),* 383-396, 2018.
D. Fuijiki, S. Mahlke, R. Das, "Duality Caches for Data Parallel Acceleration," *The 46th International Symposium on Computer Architecture (ISCA-46)*, 397-410, 2019.
D. Fuijiki, A. Subramaniyan, T. Zhang, Y. Zeng, R. Das, D. Blaauw, S. Narayanasamy, "Genax: A Genome Sequencing Accelerator," *Proceedings of the 45th IEEE/ACM International Symposium on Computer Architecture (ISCA-45, '18),* 69-82, 2018.
A. Subramaniyan, R. Das, "Parallel Automata Processor," *Proceedings of the ACM/IEEE 44th Annual International Symposium on Computer Architecture (ISCA-44, '17*), 600-612, 2017.
R. Das, O. Mutlu, T. Moscibroda, C. R. Das, "Aérgia: Exploiting Packet Latency Slack in On-Chip Network," *Proceedings of the International Symposium on Computer Architecture (ISCA'37, '10)*, 106-116, 2010.

Service: Professor Das is a diligent and valued colleague both at UM and in her broader disciplinary community. Internally, she has served as an undergraduate advisor and on graduate admissions, and as a member of the Internal Review committee for Computer Science and Engineering. She has served her professional community on numerous top-tier conference program committees, and has been selected as the program co-chair of MICRO, a top architecture conference. Professor Das has made significant contributions to diversity, equity and inclusion, with outreach to high schools, teaching first-year women interested in CS, and serving on the ACM's Women in Computer Architecture organizing committee.

External Reviewers:
Reviewer A: "Prof. Das has built an extraordinary career path at UM and performed the [sic] truly first-class research in the world."

Reviewer B: "She is a power house and an emerging leader in her field."

Reviewer C: "Reetu is among a small peer group of computer architects who are paving the way with high impact research in the post-Moore era."

Reviewer D: "she is one of an elite set of [junior] computer architects redefining our field through impactful research."

Reviewer E: "She is without a doubt a leading researcher in in-memory computing and on-chip networks."

Reviewer F: "Dr. Das's work on computing in caches … is an innovative approach that has the potential for long term impact on the design and use of computers."

Reviewer G: "She is one of the most visible assistant professors in the field of computer architecture today."

<u>Summary of Recommendation</u>: Professor Das is an established leader in computer architecture, with demonstrated leadership in teaching, research and service. It is with the support of the College of Engineering Executive Committee that I recommend Reetuparna Das for promotion to associate professor of electrical engineering and computer science, with tenure, Department of Electrical Engineering and Computer Science, College of Engineering.

Alec Gallimore (signature)

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Alec D. Gallimore, Ph.D.
Robert J. Vlasic Dean of Engineering
College of Engineering

May 2020