Georgia Tech College of Computing
School of Cybersecurity and Privacy

May 9, 2024

I am delighted to provide this letter for Dr. David Bakken whom I have known professionally for over 25 years. We have collaborated on research projects, he delivered multiple invited lectures at the Georgia Institute of Technology, and I was honored to have him serve on the doctoral committees of two of my students. Dr. Bakken had a long and impactful research career and is well known for his contributions to distributed computing systems, middleware and fault-tolerant computing systems. At Washington State University, he was able apply his expertise in such systems to develop reliable and secure communication infrastructure to support power grids. He is one of those rare researchers who have deep expertise in both advanced computing infrastructure as well as power systems. Such expertise across these areas is critical for addressing challenges that are posed by scale, reliability and security needs of critical infrastructure like the smart grid.

After completing his doctoral work at the University of Arizona, Dr. Bakken explored middleware to meet the needs of highly demanding distributed applications. These included ease of programming, performance and reliability. Middleware, which strives to meet these needs by bridging the gap between generic platforms such as operating systems and the applications, has remained an important research area with a dedicated annual research conference called "Middleware". Dr. Bakken's pioneering work in this area included the development of the QuO framework, which advanced distributed object-based middleware by offering mechanisms to support quality-of-service requirements of applications and services. In our collaboration, we actually used the Quo framework to explore object caching and consistency techniques that could be used to improve scale and performance. QuO research papers are widely cited in the research literature in middleware, which shows the high level of impact of Dr. Bakken's research.

Dr. Bakken is also an expert in the area of information technology infrastructure for power systems. Such systems are highly distributed and dynamic, and require information to be communicated reliably and in a timely manner for their proper operation. Dr. Bakken was the one of the first researchers to demonstrate that evolution of the power grid required new designs of its communication and computational infrastructure. This is a great example of how he is able

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to apply his deep expertise in distributed systems and middleware to address the unique challenges that are posed by specific application areas.

The importance of areas in which Dr. Bakken worked has been recognized by my institution (The Georgia Institute of Technology) and it has made significant investments in these areas because of their societal relevance and importance. Since he is a leading researcher in these areas and because of the impact his research has had, we invited him several times to exchange ideas and explore possible collaborations. I believe in the past two decades, we invited him to deliver half a dozen seminars to researchers in the College of Computing and the School of Electrical and Computer Engineering. His discussions with many of our researchers were at the level of distinguished seminar speakers invited by us. More importantly, these visits led to further and deeper collaborations. One of the papers we co-authored with him received a best paper award at the 2001 International Conference on Distributed Computing (ICDCS). Dr. Bakken was also invited to serve as a voting member on the doctoral committees of two of my students, Vijaykumar Krishnaswamy and Troy Zhan. He helped these students with insightful feedback and thoughtful comments that greatly improved their dissertations.

In summary, when it comes to outstanding researchers and leaders in the intersection of distributed systems/middleware and power systems and smart grids areas, I can think of no one else who would have the deep expertise like Dr. Bakken does. These areas continue to be of very high importance at Georgia Tech with a new initiative in security of engineered systems and we hope to engage Dr. Bakken in our own future research endeavors.

Please feel free to contact me if I can provide any additional information.

Sincerely,

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Bio: Dr. Mustaque Ahamad is a professor in the School of Cybersecurity and Privacy at the Georgia Institute of Technology. He served as director of the Georgia Tech Information Security Center (GTISC) from 2004 to 2012. As director of GTISC, he led the development of several research and education initiatives, including a first of its kind MS degree in Cybersecurity. Dr. Ahamad's research interests include reliable distributed systems and cybersecurity. He has published extensively in these areas and papers co-authored by him have received numerous awards. He also collaborated on a World Economic Forum project on cyber risk. He served as co-chair of MAAWG's Voice and Telephony Abuse Special Interest Group. Dr. Ahamad has also led projects which resulted in successful commercialization of research done by his group. He has co-founded Pindrop Security and Codoxo, and served as chief scientist of these companies. These venture backed companies have attracted over $200 million in funding and have developed solutions that are now deployed at leading companies in the financial, retail and healthcare sectors. Dr. Ahamad received his Ph.D. in computer science from the State University of New York at Stony Brook in 1985. He received his undergraduate degree in electrical and electronics engineering from the Birla Institute of Technology and Science, Pilani, India.

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