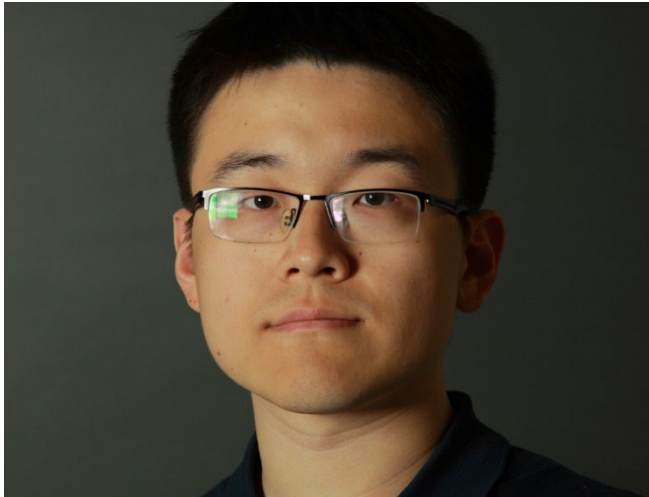


# ECE Computes Faculty Search Candidate



***Chang Gao***

Assistant Professor  
Delft University of Technology

***Monday, February 24, 2025***  
10:30 AM • MSEE 112

## ***Energy-Efficient Neuromorphic On-Device Intelligence for AIoT***

### **Abstract**

As the Artificial Intelligence of Things (AIoT) transforms our digital landscape, the fusion of edge computing and communication networks creates an urgent need for more efficient data processing solutions. Modern systems face the dual imperatives of minimizing latency and power consumption, which is critical not just for user experience but for environmental sustainability. Our research leverages neuromorphic computing's brain-inspired principles to address these challenges and has delivered three generations of dynamically sparse delta neural network accelerators, DeltaRNN, EdgeDRNN, and Spartus, achieving over 40× speedup in speech recognition while maintaining accuracy. Building on these neuromorphic principles, we extend our research to radio frequency (RF) signal processing, specifically targeting non-linearity correction in wideband RF power amplifiers crucial for emerging 6G and WiFi 7 technologies. Through OpenDPD, the first open-source digital pre-distortion (DPD) framework, we enable systematic training and benchmarking of AI-based DPD algorithms. Additionally, our mixed-precision AI-DPD approach (MP-DPD) reduces power consumption by 3× in processing near-GSps-level data rate RF signals. Looking ahead, we envision these advances helping to create ultra-efficient, intelligent edge devices that seamlessly integrate with next-generation communication networks.

### **Bio**

Dr. Chang Gao has been an assistant professor in the Department of Microelectronics at TU Delft since August 2022. He earned his PhD from the Institute of Neuroinformatics at the University of Zurich and ETH Zurich in March 2022. His research bridges neuromorphic computing with real-world applications, focusing on brain-inspired algorithm-hardware co-design for edge AI systems with applications in audio processing, robotic control, and high-speed video and RF signal processing.

### **Hosts**

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Zoom: <https://purdue-edu.zoom.us/j/98151119744> ~ Meeting ID: 981 5111 9744



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