nanoSeminar Series 2022

Institute for Materials Science

Prof. Dr. Giang Nguyen

Centre for Tactile Internet with Human-in-the-Loop (CeTI) TU Dresden

From Network Softwarization to In-Network Computing

Thursday, July 7th 2022
13:00 – 14:00

Normal: Seminar Room 115, Hallwachsstr. 3 (HAL)
Pandemic version: https://tinyurl.com/nanoSeminar-GA

In this talk, I will briefly present the transition of networking devices from dedicated hardware appliances to software components on a shared infrastructure. This transition enables computing inside communication networks or In-Network Computing. Subsequently, I will present an application of In-Network Computing to accelerate audio signal processing for industrial IoT.

Conventional Network Functions (NFs) are dedicated hardware appliances consisting of a switching fabric and the software implementing the logic of the NF. Advantages of optimized design and fine-tuning functionality with high throughput come alongside longer product development cycles and decreased service agility. Network Softwarization decouples the hardware-related packet forwarding of the NF from its functionality, which can be implemented entirely in software. That allows novel algorithms to process packets beyond the constraints of hardware switching fabrics. We transformed the centralized ICA (Independent Component Analysis) algorithm into a decentralized version to leverage the In-Network Computing paradigm, accelerating the Blind Source Separation of audio signals.

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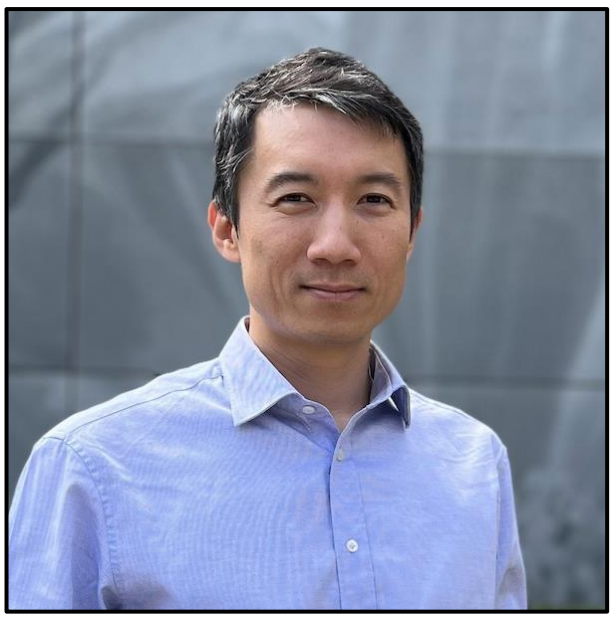

Since July 2021, Giang T. Nguyen has been an Assistant Professor, heading the Junior Professorship of Haptic Communication Systems at TU Dresden. His research focuses on networked systems' low latency, flexibility, and resilience to facilitate haptic communication. Previously, he worked on networking and edge/cloud computing at the robotic company Wandelbots, which he co-founded in 2017. Between 2016 and 2019, he was a postdoctoral researcher at the Deutsche Telekom Chair of Communication Networks, TU Dresden, working on network softwarization and information theory. Before that, he received a Bachelor's and Master's degree in Telecommunications, respectively, in Vietnam in 2001 and Thailand in 2005. Between 2010 and 2014, he was a DAAD scholar and a Ph.D. researcher at TU Darmstadt, Germany. In 2016, he obtained a Doctoral degree in Computer Science from TU Dresden.

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