CSC 8260 – Seminar in Networking, Distributed Systems, & Parallel Systems:
Energy-Efficiency in Edge Computing and Autonomous Systems – from IoT devices to Autonomous Vehicles.

Dr. Marco Brocanelli
Course Reference Number: 24306
Credit: 3.00
Class Hours: Tu.-Th. 1pm – 2:15pm
SYNC

Course Description and Goals: The traditional computing hierarchy composed primarily of mobile and cloud computing systems is bound to be augmented with an intermediary layer, the edge. Edge computing devices are installed closer to the end devices and allow a lower communication latency compared to the cloud. This new infrastructure, combined with recently developed wireless interface technologies such as 5G, enables several exciting applications that can help improve and advance our society. Edge computing is indeed considered of primary importance to support the operations of small Internet of Things (IoT) devices, drones, autonomous mobile robots, and autonomous vehicles. On the other hand, integrating these battery-dependent devices and coordinating their operations at the edge requires understanding how metrics such as latency, power consumption, and limited computing resources can affect the system performance.

In this class, we will analyze the latest techniques that try to overcome those challenges in edge computing. In particular, we will study recent research papers published in top conferences and journals. This class has two tracks: regular and self-paced. Regular students (for both Ph.D. and Master students) will have the opportunity to learn how to critique and present research papers. In addition, they will conduct a research project that involves the design and the implementation of novel solutions that address real-world problems. By the end of the semester, these projects will translate into new research papers to be published in relevant conferences and journals. Self-paced students (only for Master students) interested in gaining depth in these topics will study and discuss those research papers and work on an individual class project to complete by the end of the semester.

Grading: (Regular) 40% paper reading/presentation, 40% project, 20% final report. (Self-paced) 40% papers discussion/essay, 40% project, 20 %final report.

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