



# Seminar



**UNIVERSITÀ  
DI TRENTO**

**Dipartimento di  
Ingegneria Industriale**

## Fault Tolerant Routing and Control for Software Defined Metasurfaces

May 2nd, h. 11:00 am

Girasole room, Polo Ferrari 2, Via Sommarive 5, Trento

### Speaker

Marios Lestas, Frederick University, Cyprus

#### Info

DII - Dipartimento di  
Ingegneria Industriale  
tel. +39 0461 282500  
dii.supportstaff@unitn.it

HyperSurfaces (HSFs) consist of structurally reconfigurable metasurfaces whose electromagnetic properties can be changed via a software interface, using an embedded miniaturized network of controllers. Such HSFs enable novel capabilities in wireless communications, rendering them well established by now as a candidate technology for 6G applications. With the HSF controllers, interconnected in an irregular, Manhattan-like geometry, we propose, develop and evaluate a robust, deterministic Fault-Tolerant (FT), deadlock- and livelock-free routing protocol that is able to deliver software directives to connected network controllers in the presence of multiple failing nodes. The proposed FT protocol can support an unbounded number of faulty nodes as long as nodes outside faulty blocks are connected. Complementing the HSF with a set of layered protocols and an Application Programming Interface allows for its real time adaptation for autonomous operation without human intervention. Towards this goal feedback based control algorithms have been designed with demonstrated effectiveness in the presence of feedback delays and moving targets. Our most recent workings on the use of metasurfaces in vehicular networking and data-centers will also be briefly introduced.

*Local contact: giulia.giordano@unitn.it*