Institute for the Wireless Internet of Things
at Northeastern University

“Technical Enablers for Iterative Regulatory Processes”

Tommaso Melodia
William Lincoln Smith Professor
melodia@northeastern.edu
A National Spectrum Agenda

- Conquering the Spectrum
- Programming the Spectrum
- Protecting the Spectrum
- Legal, Ethical, Economical, Policy
- Enables Fine-Grained Control

Service Management and Orchestration Framework

Non-real-time RIC

Near-real-time RIC

1. Open, standardized interfaces
2. Disaggregated RAN
3. Open-source contributions

4. RAN Intelligent Controllers
CHARM: Dynamic Spectrum Sharing in the Open RAN

- Dynamic Spectrum Sharing for **mobile** and **WiFi** co-existence in unlicensed bands
- **Machine learning** for communication technology classification
- Policy-driven base station **reactions** to spectrum usage
  - Power control
  - Bandwidth change, Frequency change
  - Inter-frequency (LTE-U/LTE-LAA)
  - DSS activation
- Designed as an O-RAN **xApp**

Dynamic spectrum sharing for coexistence above 100 GHz enables **coexistence and more spectrum** for active and passive users

First experimental demonstration of dual-band sub-THz backhaul
- track sensing satellite
- switch band to avoid interference