

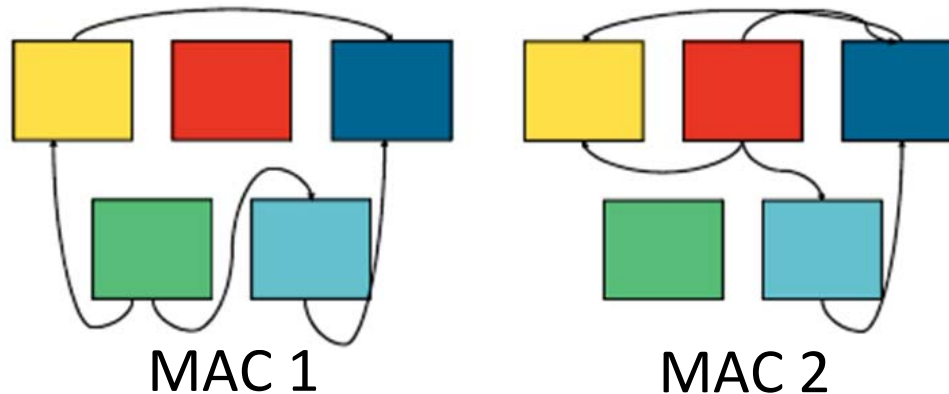
# Decomposable MAC Framework for Highly Flexible and Adaptable MAC Realizations

Junaid Ansari, Xi Zhang, Andreas Achtzehn,  
Marina Petrova and Petri Mähönen

Institute for Networked Systems  
RWTH Aachen University, Germany

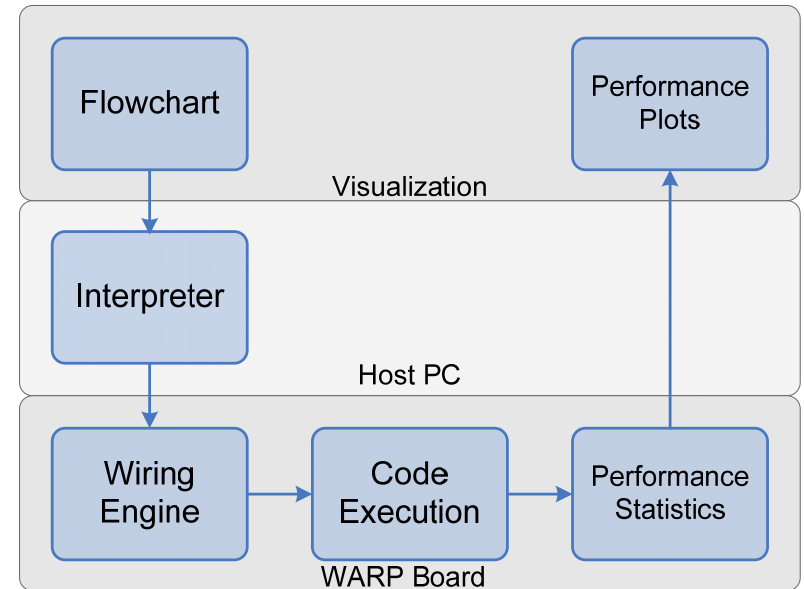
# Concept

- Decomposition of MAC protocols into **fundamental functional blocks** based on the commonalities among different MACs.
- Realization of a particular MAC solution by **binding** the blocks together appropriately through a **Wiring Engine**.
- On-the-fly composition and **reconfiguration** of MAC protocols with high degree of **code reuse**.
- A key enabling technology for implementing and prototyping Cognitive Radios and dynamic wireless devices.



# Design and Implementation

- Granular MAC blocks are implemented with flexible APIs on WARP boards.
- A **MAC Description Language** eases implementation effort for users.
- **Interpreter** translates user inputs into executable instructions.
- **Wiring Engine** coordinates *data* and *control* flow between blocks and allows run-time configuration by block insertion and removal through a set of dependency tables.



Implementation Modules

# Demonstration and Visualizations

- Users can interactively compose and modify MACs at runtime through flowcharts.
- Corresponding auto-generated MAC code is shown.
- Live performance statistics of the MAC is displayed.
- A spectrum-agile MAC developed using the framework is shown to reconfigure based on the user controlled interferences.

