- EXPERT -
Experimental evaluation of routing adaptation scenarios for wireless networks

GOALS

- **Study the impact of link estimation algorithms used by routing protocols on the overall WSN performance**

- **Develop an algorithm that could automate the selection of link estimators in real-time**

- **Evaluate the algorithm in a real WSN infrastructure**

CHALLENGES

- **Retrieve and process network measurements in real-time**

- **Define adaptation strategies for link estimation algorithms**

- **Switch between link estimators following the Over-The-Air (OTA) programming paradigm**

EXPERIMENTAL SETUP
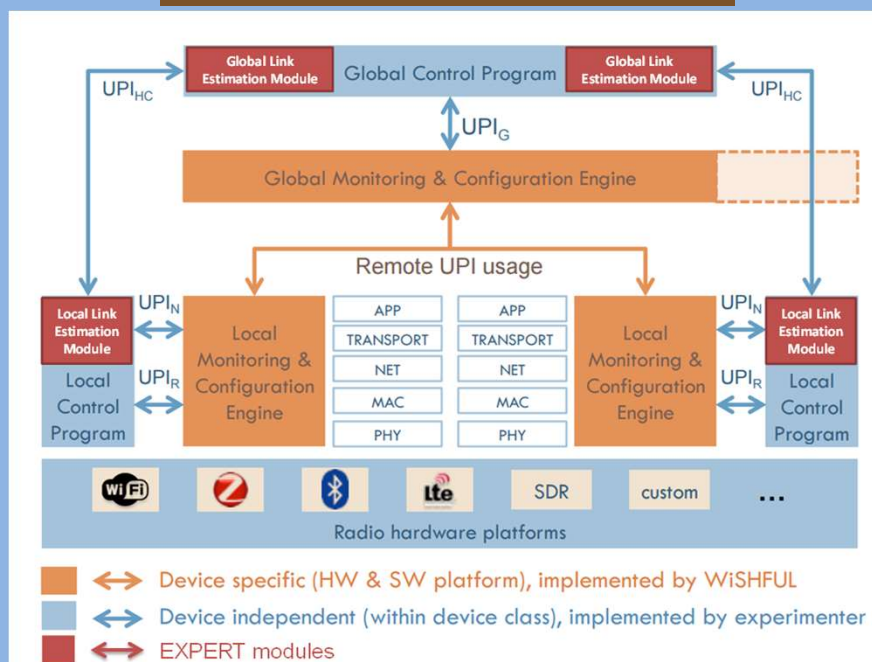
- **EXPERT modules operate in two layers.**

- **Local Control Program takes advantage of the abstract UPI_R and UPI_N and implements a routing optimiser that controls the radio & network protocol stack.**

- **Global Control Program uses the UPI_G interface to gather information and control the behaviour of a group of nodes.**

- **EXPERT monitors a wide range of network parameters in real time (e.g., Packet Delivery Ratio, % Radio on Time, #hops, #retransmissions, RPL_PARENT value, RPL_DIO messages) to select the appropriate link estimator.**

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RESULTS
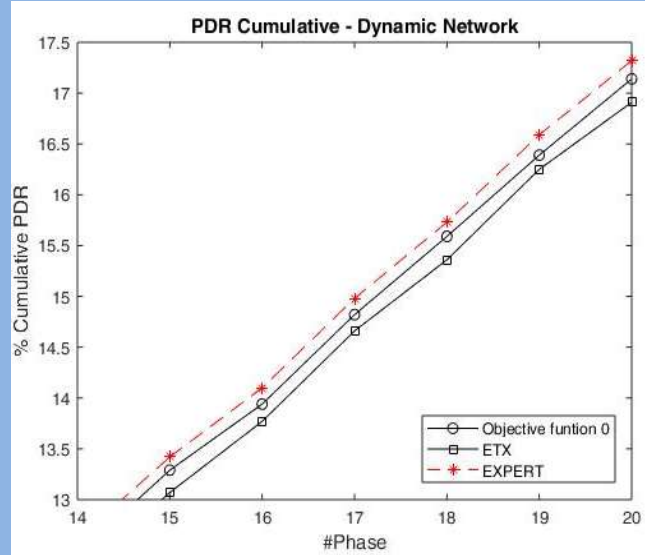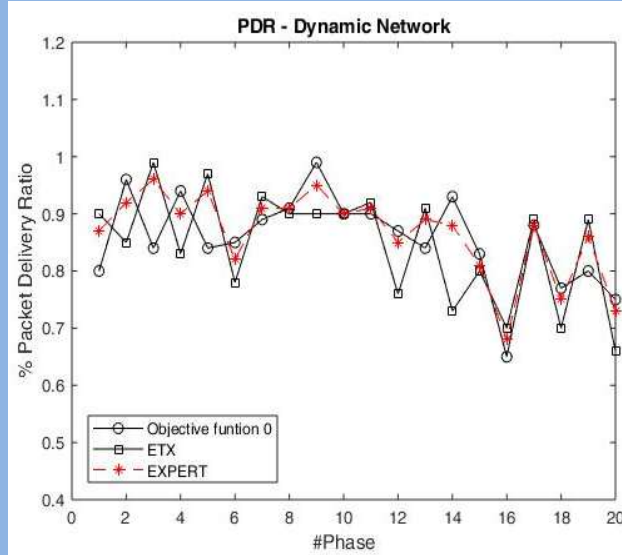
- **Evaluation of link estimation algorithms under different network settings**
- **Development of a dynamic algorithm for the OTA selection of the optimal link estimator**
- **Evaluation of the algorithm in a real world environment**

CONCLUSION

- **EXPERT developed a network routing optimizer that automates the selection of link estimators according to given application requirements and network conditions. The outcomes led to a unique commercial solution with respect to dynamic selection of link estimation strategies for optimized routing.**

FEEDBACK

- **Thanks to WiSHFUL, our company was able to evaluate a number of product-oriented routing adaptation scenarios under different experimental settings without purchasing any network equipment at all. The control plane of the platform allowed us to develop and validate remotely a unique algorithm for the dynamic selection of link estimators.**

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