Intelligent Handover Decisions Driven by Traffic Forecast

Context

The foundation of 5G and beyond mobile networks lies in the convergence between networking and computing. The most appealing realization of such convergence is the application of AI to optimize network functions. Mobile networks are indeed becoming increasingly complex, heterogeneous, dynamic and dense, which makes extremely hard to model correctly their behavior and model-free AI solutions are a promising solution.

Specifically, we tackle the problem of handover optimization. Although this network mechanism was the subject of significant investigation efforts in the past, its performance are yet far from optimal. Recent measurement studies have unveiled that in many cases handovers are triggered inopportunely (i.e., the mobile still benefits from good coverage in the serving cell) and towards non-appropriate target cells (i.e., the load in the target cell is higher than the serving cells, thereby degrading the achievable throughput). Traffic classification and prediction can help shaping better handover policies. For example, by anticipating the future loads of neighboring cells, the serving cell could steer the handover to a cell that can sustain the user traffic demand and avoid throughput degradation.

Objectives

The student will work in the development of traffic prediction schemes at different levels: future load of individual base stations and individual users. Such outputs will drive a novel solution for handover based on both signal strength and future traffic loads. The student will analyze existing datasets and apply the most suitable ML technique (e.g., LSTM) for the prediction. To this end, hands on in Linux-based scripting and data analytics is required as well as good knowledge with programming languages. During the internship, the student will acquire practical experience in multiple areas such as network data analytics and mobile network operation.

Requirements

- Strong skills with programming languages for data analytics
- Hands on with Linux-based software and networking equipment
- Good command of English language is essential
- Ability to work independently as well as in a team

Note

The student will benefit from a reimbursement during the stay.

Contact

For inquiries and to apply, please contact Dr. Claudio Fiandrino (claudio.fiandrino@imdea.org).

Credit Images: CC0, public domain

IMDEA Networks Institute
Avenida del Mar Mediterraneo, 22 - 28918 - Leganes (Madrid) - SPAIN
phone +34 91 481 6210 · fax +34 91 481 6965 · e-mail info.networks@imdea.org