wireless part (e.g., shared medium, multi-path fading), and they are also subject to more
higher number of details as compared to wired networks given the complexity of their
troubleshooting emulation anomalies. These heterogenous cellular networks include a
actors (e.g. operators, cloud providers), and validating its performance in detecting and
framework to sliced cellular networks embracing different technologies (edge, core) and
level measurements at the emulated link level. We aim in this thesis on extending this
metrics and the experiment itself (the experiment itself can cause congestion of the
not made possible to the experimenter (case of a cloud experiment) and even when
knowledge on what should be the output of the experiment itself. Monitoring the
Verifying if an emulation has well passed is a challenging task as there is no a priori
Principales activités
Network emulation can be disturbed by several phenomena such as a saturation of the
underlying network, or a lack of computing resources on the physical machine(s).
Verifying if an emulation has well passed is a challenging task as there is no a priori
knowledge on what should be the output of the experiment itself. Monitoring the
underlying infrastructure can bring some hints, but in many cases such monitoring is
not made possible to the experimenter (case of a cloud experiment) and even when
made possible, it does not involve a direct link between the infrastructure performance
metrics and the experiment itself (the experiment itself can cause congestion of the
infrastructure, which is deemed to be normal). In another context in the Diana team, we
are working on a framework for emulation validation of wired networks using packet-
level measurements at the emulated link level. We aim in this thesis on extending this
framework to sliced cellular networks embracing different technologies (edge, core) and
actors (e.g. operators, cloud providers), and validating its performance in detecting and
troubleshooting emulation anomalies. These heterogeneous cellular networks include a
higher number of details as compared to wired networks given the complexity of their
wireless part (e.g., shared medium, multi-path fading), and they are also subject to more
perturbing phenomena such as the interference of other wireless devices. Moreover, the experimental evaluation of disaggregated sliced radio networks involves several components that can also be emulated such as a gNodeB physical layer or a large number of UEs for scalability. The thesis will propose and implement a framework for emulation realism verification that allows (i) to establish reference models of what should be the behavior of a cellular experiment, (ii) to collect measurements about the emulation and build performance metrics that can be compared to their reference values, (iii) detect if the emulation has encountered any problem and identify the parts of the network that are responsible of the degradation, and (iv) propose solutions to remedy from the emulation problems. We will work on testing the proposed framework over wireless platforms, and in particular, the SophiaNode platform, based on R2lab, which allows running reproducible experiments in an anechoic environment.

Compétences
Strong knowledge in network protocols, mobile networks, network measurement, data analytics.
Strong programming skills: python, scripting, java/C++, etc.

Avantages
- Subsidized meals
- Partial reimbursement of public transport costs
- Leave: 7 weeks of annual leave + 10 extra days off due to RTT (statutory reduction in working hours) + possibility of exceptional leave (sick children, moving home, etc.)
- Possibility of teleworking and flexible organization of working hours
- Professional equipment available (videoconferencing, loan of computer equipment, etc.)
- Social, cultural and sports events and activities
- Access to vocational training
- Contribution to mutual insurance (subject to conditions)

Rémunération
Gross Salary per month: 2051€ brut per month (year 1 & 2) and 2158€ brut per month (year 3)