Machine learning for multi-antenna systems

Background
Ericsson Research is looking for Master Thesis candidates with enthusiasm and skill, to be part of our current Radio research and specifically in our research on machine learning for communication purposes.

Assignment 1
The objective of the thesis, based in Kista, Stockholm, is to design a machine learning system for reception (and possibly positioning) of communication signals for a two- or three-dimensional antenna array. Implementation aspects may also be considered.
As a student, you will be involved in the developing of such algorithms as well as implementing and testing them by means of computer simulations. The assignment involves the understanding of the theoretical foundations, developing simulation environments and evaluating the results.

Deliverables
Deliverables expected at the end of the thesis project include clearly documented working code, a final thesis report, and a live presentation of the final implementation and outcome to an Ericsson audience. Note that these are in addition to your university thesis requirements.

Qualifications
As a person, you want to perform at your best and you want to participate in deep technical discussions with other team members. You believe that technical innovation involves the theoretical foundation and applying them in developing realistic models.
We are looking for a self-motivated and creative student with the following qualifications:

- Master student in the area of Engineering Physics, Electrical Engineering, Computer Science, or similar
- Fluency in English
- Excellent analytical skills
- Hands-on programming experience, preferably in Python, R, C/C++, MATLAB
- Ability to work independently
- Good knowledge of linear algebra, optimization theory, signal processing and machine learning is a merit

Deep learning and communication systems

Background
Ericsson Research is looking for Master Thesis candidates with enthusiasm and skill, to be part of our current Radio research and specifically in our research on machine learning for communication purposes.

Assignment
The objective of the thesis, based in Kista, Stockholm, is to understand analyse deep learning and apply to communication systems. Tishby's has suggested an interpretation of deep learning as a development of mutual information, https://arxiv.org/pdf/1703.00810.pdf. O'Shea och Hoydis have proposed to consider the entire communication system as an auto-encoder, e.g., https://arxiv.org/pdf/1702.00832.pdf. In this work, the student should reproduce the work of Tishby and determine how this can be extended to also include the communication system.
As a student, you will be involved in the developing of such algorithms as well as implementing and testing them by means of computer simulations. The assignment involves the understanding of the theoretical foundations, developing simulation environments, and evaluating the results.

Deliverables
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Qualifications
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- Good knowledge of linear algebra, optimization theory, signal processing and machine learning is a merit