Continual learning with complex adaptive networks

Summary

Continual learning may be defined as the ability to integrate new information from new experience without the destruction of past information, and the capability to selectively use the past knowledge when exposed to a particular task. This indispensable property of intelligence cannot achieved in current machine learning systems. A method recently developed by LIA based on structurally adaptive networks has, in preliminary experiments, demonstrated considerable success in being capable of continual learning while protecting past information and capable of selectively using past information in response to a presented task.

In this project, your goal will be to learn and use this method, as well as other measures proposed in the literature against the destruction of past information, to establish their capabilities and limitations across a wide range of tasks. To this end, you will be implementing and experimenting with different methods in the literature, and performing comparative analysis of how and where they succeed or fail.

Type: Bachelor or Master project (For Master students only – Please note that 30-credit Master project applicants will be prioritized.)

Requirements:

- Familiarity with Python
- Familiarity with machine learning concepts and neural networks

Contact: Zeki Doruk Erden, *zeki.erden@epfl.ch* | To apply, please send me your CV, your grades (bachelor and master), and briefly inform about why you are interested in this project.