Risk Aware Data Driven Demand Response (RISK)

A key enabler of large-scale renewable generation will be demand response (DR), or adjusting flexible consumption patterns to match variable generation. Commercial buildings are an excellent DR target as they represent more than 40% of EU energy consumption and many have advanced building management systems. Ongoing work at LA has demonstrated that novel control techniques enable buildings to provide a range of important grid services. The next challenge on the road to commercial realization is to reduce the cost of modeling and controller development by an order of magnitude.

The RISK project will develop novel data-driven predictive control techniques that will expedite the modelling and control design effort, providing a large reduction in the acquisition cost of flexibility from commercial buildings, while simultaneously enabling an increase in control quality. To achieve these objectives, RISK will develop new identification, control and computational techniques, and then prove their value on a network of buildings on the EPFL campus.

The student will work in a collaborative project and will join a team with a wide expertise in control, optimization and computational methods. A candidate successfully completing a PhD within this team can expect to become an expert in optimization, predictive control and the practical application of these techniques in a challenging and important domain. The project involves a solid mix between control, optimization and machine learning theory as well as the development of practical optimization-based control tools for demand response: the candidate will be expected to develop novel theory in the area of data-driven and stochastic predictive control, and to develop and prove their techniques by applying them to automated demand response for a number of buildings on the EPFL campus.

The ideal candidate will have a background in control systems and / or optimization, solid programming skills and an interest in developing both novel theory, as well as practical tools. Outstanding students with only a partial match to this list are encouraged to apply.

The successful candidate can expect a gross salary starting at 51’100CHF for a PhD and 81’900CHF for a PostDoc together with other benefits depending on civil status.

EPFL is a top technical university, ranked 2nd for Engineering in Europe (2012), and is based in the Olympic Capital of Lausanne, a Swiss city well known for its high quality of life.

To Apply

1. (PhD) Fill in the form provided by the doctoral program in Electrical Engineering. Indicate your intention to apply to Prof. Colin Jones. phd.epfl.ch/edeeapplicants
2. (PhD) Email the completed application package directly to Prof. Jones indicating your interest in this project.
   - (PostDoc) Please email a CV, a sample paper and references to colin.jones@epfl.ch

Deadlines

- Call open from March, 2018 and will remain open until ideal candidate found
- Start-date flexible; Summer 2018 ideal