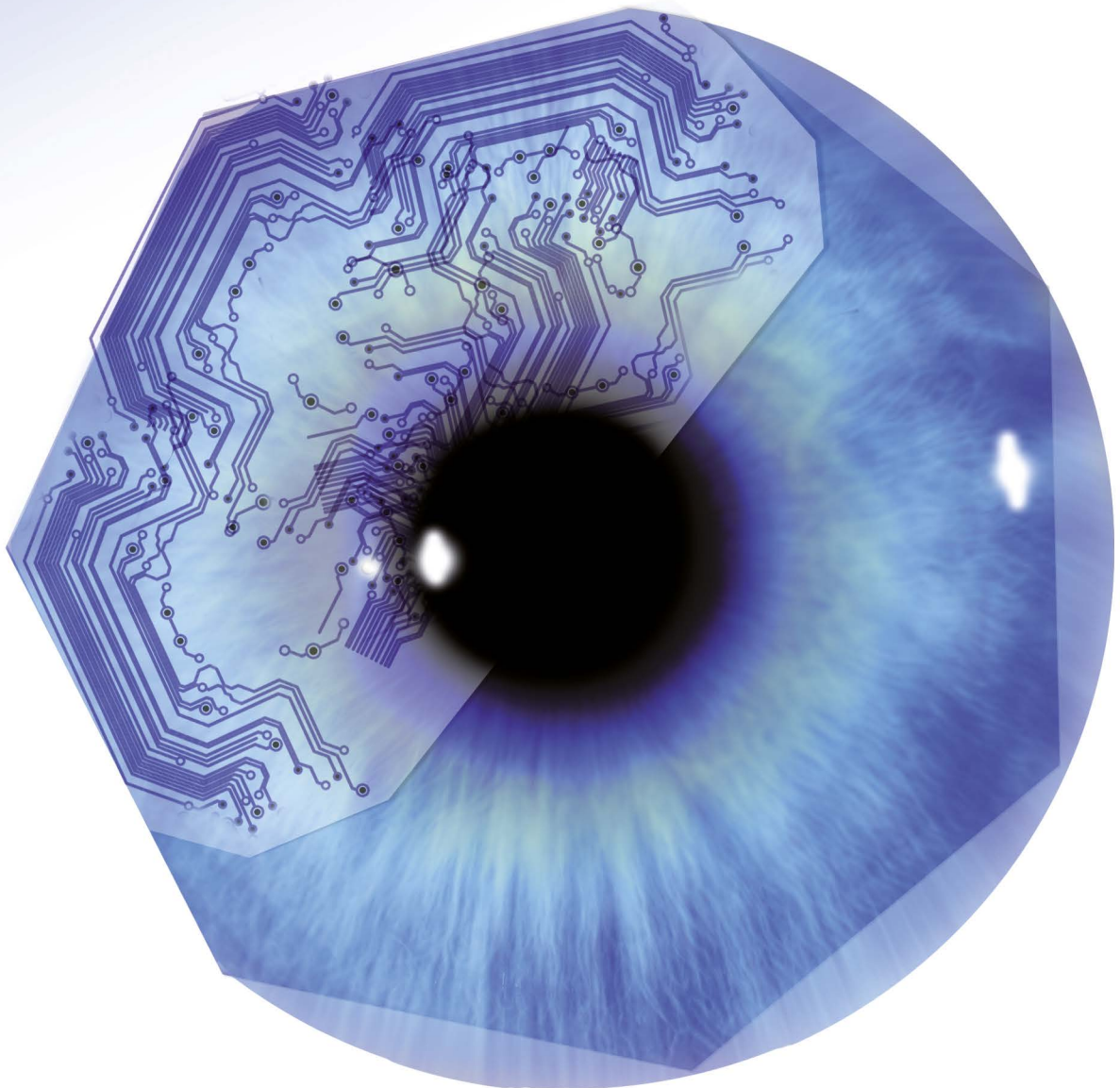


DOCTORAL  
SCHOOL

# ELECTRICAL ENGINEERING

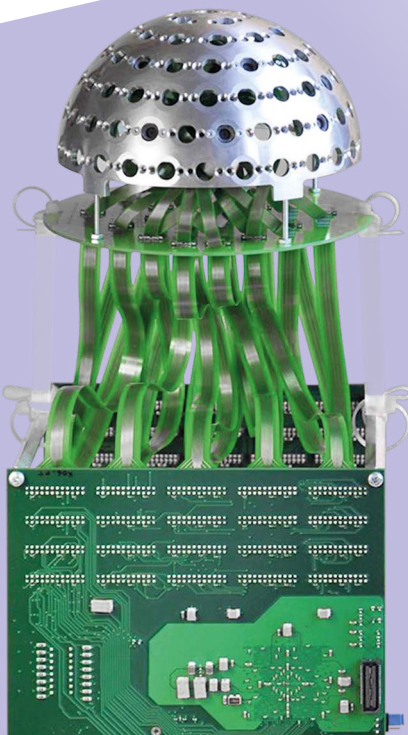


**EPFL**

The doctoral program in Electrical Engineering (EDEE) at EPFL is the focal point for PhD theses in the fields of Electronics, Information Technologies and Electrical Energy. Being one of the largest doctoral programs at EPFL, EDEE offers a complete network of internationally leading research groups, advanced doctoral courses and attractive scientific and social activities.

### The Panoptic camera

Omnidirectional stereoscopy and depth estimation are complex problems in image and video processing that need novel solutions to support real-time operation. The Panoptic camera is a biologically-inspired multi-camera vision sensor. It is a polydioptric system mimicking the eyes of flying insects where multiple imagers, each with a distinct focal point, are distributed over a hemisphere. This collaboration between two labs of EPFL's Institute of Electrical Engineering lead to the development of innovative omnidirectional image reconstruction algorithms (OIR) and to the realization of customized hardware imaging platforms. The combined hardware/software system enables advanced real-time applications including omnidirectional image reconstruction, 3D model construction (3D display) and depth estimation. A start-up company has been created to commercialize this innovation.



# A time machine to protect future smart grids

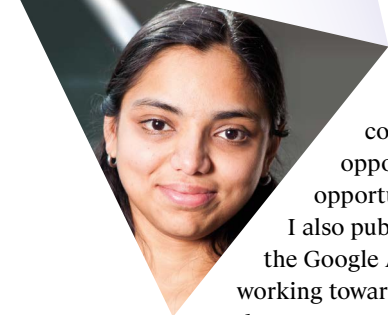
Would it be possible to create a time capsule that allows to rewind the time in order to study the dynamic evolution of a power system subsequent to a fault? The reply to this question is definitely yes, and it is coming from the PhD thesis of Reza Razzaghi from the Distributed Electrical Systems (Prof. Mario Paolone) and Electromagnetic Compatibility (Prof. Farhad Rachidi) laboratories. The outcome of this research is to produce a new class of protection devices to be used in the context of smart grid applications.

In particular, these new protections will merge two main functionalities, namely the identification and the location of a fault in a power network by time-reversing the electromagnetic transients generated by any kind of fault in power systems.

The applicability of this method has been already validated on a large variety of power systems ranging from transmission to distribution networks with inhomogeneous and complex topologies.

## Reza Razzaghi

EPFL PhD student



## Lakshmi Saheer,

EPFL PhD student working at the Idiap Research Institute in Martigny, Switzerland.

I first heard of EPFL and Idiap while doing my Master's at the Indian Institute of Technology Madras (India). Both these places were well known at my university as hubs for high quality research in speech and signal processing. So, when I decided to come back to research life and pursue a PhD, these were the places I wanted to be.

During my doctoral course at EPFL, I was involved in an European project with international partners, and this helped me generate high quality collaborative research and publications. The brilliant research colleagues and supervisors at Idiap helped me approach my research problems with ease. Students get the opportunity to attend all relevant international conferences and workshops in their area. This gives a great opportunity to meet and personally have discussions with the legends in our respective areas of research.

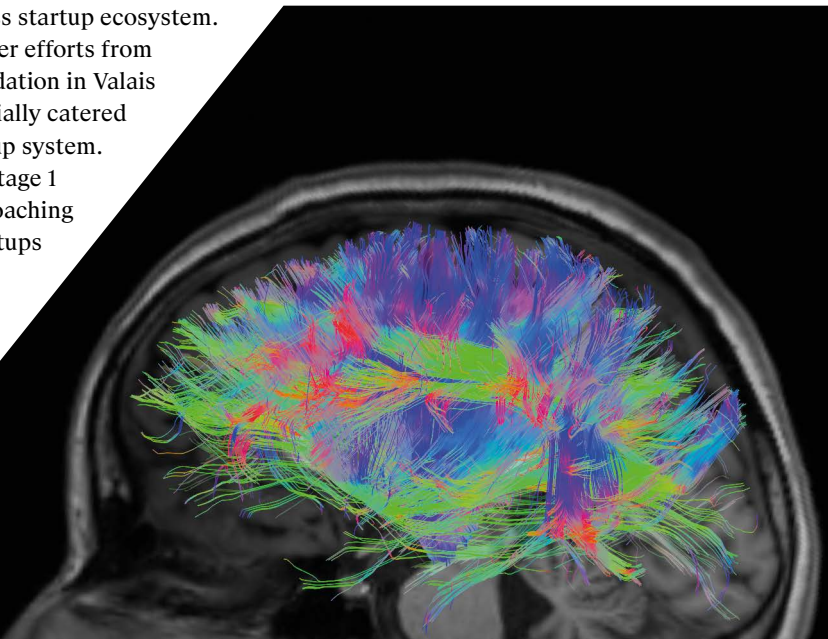
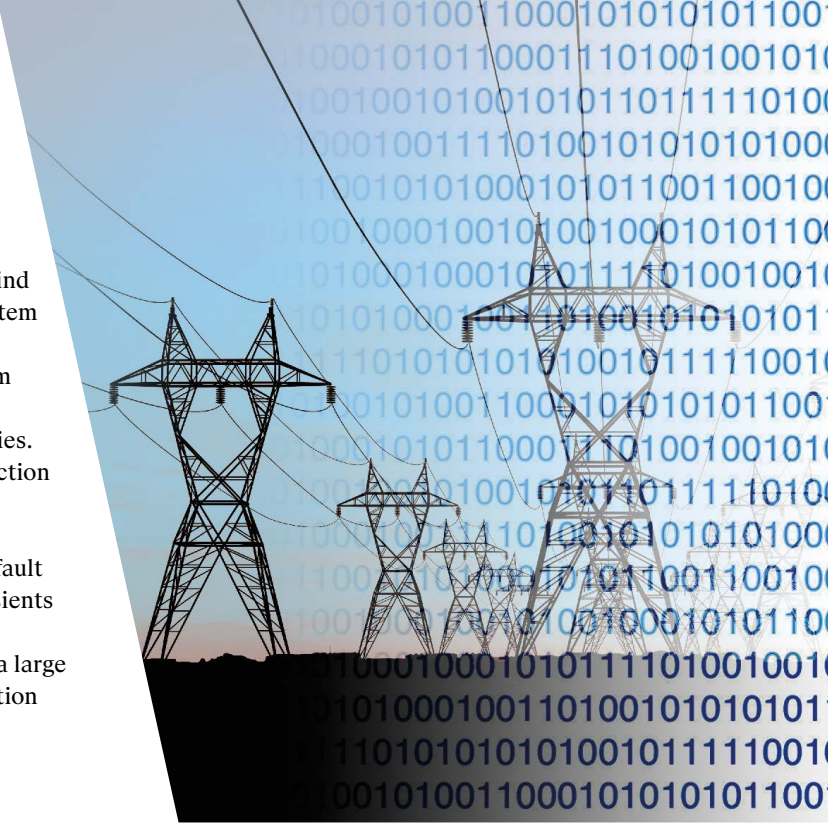
I also publish several publications in international conferences and journals. I also won some recognition like the Google Anita Borg scholarship and the Idiap Paper Award during my course. Being paid a good stipend while working towards a doctorate in our area of interest was a dream come true for me. I even had paid maternity vacation and great support from my supervisors and colleagues when I had my daughter in the middle of my doctoral studies.

After finishing my PhD I wanted to pursue an entrepreneurial career. Being an alumni of EPFL gave me direct access to the Swiss startup ecosystem.

I discovered that grants like EPFL's Innogrant, other efforts from Venture lab, or the foundations like the Ark foundation in Valais (which Idiap is a participant of) are efforts specially catered for researchers like me to blend into the startup system.

I won the Ark bourse and the Venture Kick Stage 1 funding. There are different funding and coaching options in Switzerland for promoting startups and being an EPFL graduate gives easy entry to most of these programs.

Overall, this is the perfect place for my dream career.



# The EPFL doctoral program in Electrical Engineering (EDEE) is one of the largest doctoral programs at EPFL: 190 PhD students are currently affiliated to the program and the number of applicants is between 400-450 per year.

The admission is on a competitive basis  
(yearly admission rate: 8-10%)

## Application process

You need to complete and submit the EPFL Doctoral School online application form. The application process is entirely electronic:

[phd.epfl.ch/application](http://phd.epfl.ch/application)

Beforehand, we encourage you to surf the EPFL Doctoral School and EDEE program webpages to get an idea of ongoing research in Electrical Engineering at EPFL:

[go.epfl.ch/phd-edee](http://go.epfl.ch/phd-edee)

At the time of enrolment to the EDEE program, applicants must have successfully passed a master's degree.

PhD students are hired as EPFL employees at highly competitive conditions. Consequently your application will be considered in respect of the available financial support and open positions in relevant laboratories.

## Deadlines

The EDEE application deadlines are:

**December 15th, April 30th, September 15th**

## General information

The EDEE program is in English. The typical duration of the program is four years. Students can start the program at any time of the year.

## Requirements

At the end of the first year, students have to submit a research plan and pass a qualifying exam.

In order to successfully complete the EDEE doctoral study program, students must acquire 12 course-credits among the doctoral courses provided at EPFL.

## Research Areas

Circuits and Systems

Signal and Image Processing

Machine learning

Electronics

Computer Engineering

Optics and Photonics

Telecommunications

Electromagnetic Fields and Waves

Automatic Control

## Contact information

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