



## STudent REseArch Mobility Programme (STREAM) Project proposal



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**Host University:**  
Universität Zurich

**Field:**  
Information and communication technologies

**Specified field, subject:**  
Neuromorphic Engineering



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**Research project title:**  
Neuromorphic VLSI Circuits for Smart Microanalytical Systems

**Possible starting month(s):**

Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
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**Possible duration in months:**

1	2	3	4	5	6
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

*Exact starting and end dates will be discussed between the supervisor and the student*



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**Suitable for students in:**     Bachelor level     Master level



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**Prerequisites:**

- Enrolled in Master's degree in Electronics/IT Engineering (or similar) covering: analog and digital VLSI circuit design, sensors and instrumentation, and mixed signal processing.
- Competent with Cadence EDA tools for IC design, and/or experience with PCB design and FPGA programming.
- Experience with programming in C++, Java and/or Python.
- Team player and strong communicator. Capacity to work on own initiative.
- Good written and spoken English.



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construire l'avenir

**Restrictions:**  
NONE



**Description:**

This research work is part of a European project with academic and corporational partnership, aiming to integrate novel adaptive microanalytical solutions to address the global challenge of real-time environmental monitoring. You will have the opportunity to collaborate with a multidisciplinary team with expertise in neuroscience, computer science, environmental science, chemistry and microelectronics.

Under the Swiss-European Mobility Programme (SEMP), you will explore new ultra low-power neuromorphic VLSI circuits for the readout of smart electrochemical sensors: solid-state conductimetric, amperometric and potentiometric devices fabricated by our academic partner in Barcelona, IMB-CNM(CSIC).

- Design and validate efficient compressive, event-based sensing architectures to enable on-demand operation on mobile devices powered by



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batteries or local energy harvesting. You will develop your circuit proposals following standard custom IC/FPGA design methodology.

- Characterize your prototypes at both electrical and electrochemical levels. You will benchmark the designs in the field together with the associate company.

**Department:**

Sensors Group, Institute of Neuroinformatics.

**Contact person:**

Katja Durkin, Project Manager, International Relations Office

**Contact email:**

Katja.durkin@int.uzh.ch

**Deadline for nomination to reach host university:**

31. December 2017

**Notification of admission given by the end of:**

February 2018

**Additional information:**

NA



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