Cyril Picard

Father of one child
ACM, ASME, Design Society and IEEE member

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EDUCATION

Doctor of Science (Ph.D.) | Energy | EPFL, Switzerland   06.2016–06.2021

Thesis: *Automated Design: A Journey Across Modelling, Optimization, and Education* (2021-06-25)
Supervisor: Prof. Jürg Schiffmann

Master of Science (M.Sc.) | Mechanical Engineering | EPFL, Switzerland   09.2013–09.2015

Thesis: *Non-destructive testing imaging system with real-time probe position acquisition*
Supervisor: Dr. Christophe Salzmann

Bachelor of Science (B.Sc.) | Mechanical Engineering | EPFL, Switzerland   09.2010–07.2013

Bachelor project: Automated Foosball system to outperform a human player (youtu.be/QQS0415YYW4).

Primary, secondary, and high-school education in Geneva, Switzerland
One semester abroad during 9th grade at the French American International School, San Francisco, CA, USA

RESEARCH & PROFESSIONAL EXPERIENCE

Postdoctoral Fellow | DeCoDE (Prof. Faez Ahmed), **MIT**, USA   09.2022–08.2024

Research funded by own grant from the Swiss National Science Foundation: "AIDO: AI-enhanced design optimization". The project is to bridge two fields: machine learning and optimization, to enable fas and accessible computational engineering design. Development of representative benchmark problems to support reproducible research in mechanical engineering. Coaching and supervising a PhD student from the lab.

Postdoctoral researcher | EDAC (Prof. Kristina Shea), **ETH Zürich**, Switzerland   08.2021–08.2022

One-year project to add hands-on labs in design and material selection to an existing first semester course, and to provide the students with a more consistent learning experience. Development of a 3D visualization tool for Moodle and a low-cost 3-point-bending machine. A special focus was given to ensure that the course is attractive to female students. Setting up a longitudinal study (RoADS), with the department of psychology, to monitor the relation and dynamics between sense of belonging and academic outcome in first year students (data acquisition on-going). Following the work of and advising PhD students from the lab.

Doctoral assistant | LAMD (Prof. Jürg Schiffmann), **EPFL**, Switzerland   06.2016–06.2021

Investigation of system-level modeling methods and multiobjective optimization algorithms to automate the design of automotive actuators (collaboration with Johnson Electric). Evaluation of the learning of professional skills by students and their use of optimization tools. Diverse teaching duties, including student supervision and creation of projects.

Board member | President (2017-2019) | «terragir, énergie solidaire», Meyrin, Switzerland   06.2012–06.2019

Supervision of the operations and strategy of the nonprofit organization working on awareness programs about sustainable development (terragir.ch, turnover of about CHF 500'000). Recruitment of a new executive director (2016) and transition of the organization to horizontal management (2019).

Research assistant | iHomeLab, Lucerne, Switzerland   12.2015–05.2016

Active on research projects in the field of energy efficiency and building intelligence. Design of control strategies to reduce the energy consumption and promote load shifting (network stabilization) in service buildings and individual homes.

R&D Engineer (Master thesis) | Sensima Inspection, Gland, Switzerland   02.2015–10.2015

Design of an innovative product to simplify the detection of defects in metal parts by delivering real-time 3D views of eddy-current measurements. Integration of a positioning system into existing company hardware and software to collect. Product demonstration and discussion with potential clients at the ASNT Annual Conference (Salt Lake City, UT).

Initiator and project leader | Startup project: CushEar 02.2013–12.2013
Development of a prototype of smart earplugs and of the associated business cases. Management of a team of five.

Project manager (during civil service) | «terragir, énergie solidaire», Meyrin, Switzerland 10.2009–03.2010
Manager of the *Robin des Watts* project: awareness lessons for children on energy savings and sustainable development. Design of specific training tools for teachers. Close collaboration with public administration in Geneva.

Intern | Swiss Institute of Bioinformatics (SIB), Lausanne, Switzerland 05.2007–06.2007
Development of a web app to store, analyze and visualize genomic data, in collaboration with the University of Basel.

TEACHING ACTIVITIES

Substitute lecturer | CAD&TZ and Product Development and Engineering Design (Prof. Shea) | ETH Zürich 2021-2022
Occasional lecturing for two courses. Preparation and oversight of exercise sessions of CAD&TZ.

Mentor | Artificial Intelligence and Machine Learning for Engineering Design (Prof. Ahmed) | MIT Fall 2021
Coaching two groups of 4 students working on machine learning approaches for mechanical design problems.

Lead teaching assistant | Applied Mechanical Design (Prof. Schiffmann) | EPFL Fall 2016–2020
Yearly selection of a design topic for the class and preparation of the material for students (~30). Lecturing modules on project management and design optimization. Mentoring groups (two per year) of students and grading their reports.

Lead teaching assistant | Mechanical Systems (Prof. Schiffmann) | EPFL Spring 2017–2019
Creating exercises and mentoring students during exercise sessions. Creating a new in-course project, including material for students, the grading sheets and a semi-automated grading script. Occasional lecturing. Grading of projects and exams.

SUPERVISION OF JUNIOR RESEARCHERS

Master theses at EPFL, Switzerland

- Eugène Lemaitre, *Actuator Synthesis and Optimization: Evaluation of Graph-Based Approaches* (02.2020–07.2020)
- Guillaume Spaeth, *Automated Design Tools for Electro-mechanical Actuators* (09.2019–01.2020)
- Soheyl Massoudi, *Integrated Robust Design of High-Speed Compressor Mounted on Herringbone Grooved Journal Bearings* (09.2019–01.2020)

Close coaching and supervision of PhD students (4) at ETH Zürich and MIT

AWARDS AND FELLOWSHIPS

- Swiss National Science Foundation Postdoc.mobility Fellowship (P500PT_206937, 2022-2024)
- 2018 ASME Turbo Expo Best Paper Award (GT2018-76349)
- 2017 SIEGVO Summer School Best Assignment Award
- Bombardier Award for best grades during M.Sc. (10.2015)
- venture kick: Stage 1 kick-off funding for potential entrepreneurs (10.2013)
- EPFL Excellence Fellowship (2013–2015) for outstanding academic records during B.Sc.
- Prix Marc Birkigt for best grades in mathematics and physics in high-school (06.2009)

PUBLICATIONS

Journal articles

- C. Picard and J. Schiffmann (in preparation) "Students Outperform Experienced Engineers with Automated Design Tools".
- S. Massoudi, **C. Picard**, and J. Schiffmann (2022) "Robust Design Using Multi-Objective Optimisation and Artificial Neural Networks with Application to a Heat Pump Radial Compressor," *Design Science*, doi: 10.1017/dsj.2021.25.
- **C. Picard**, C. Hardebolle, R. Tormey, and J. Schiffmann (2022) "Which professional skills do students learn in engineering team-based projects?," *European Journal of Engineering Education*, doi: 10.1080/03043797.2021.1920890.
- **C. Picard** and J. Schiffmann (2021) "Realistic Constrained Multiobjective Optimization Benchmark Problems From Design,"

IEEE Transactions on Evolutionary Computation, doi: 10.1109/TEVC.2020.3020046.

- V. Mounier, **C. Picard**, and J. Schiffmann (2018) "Data-Driven Predesign Tool for Small-Scale Centrifugal Compressor in Refrigeration," *Journal of Engineering for Gas Turbines and Power*, doi: 10.1115/1.4040845.

- E. Birrer, **C. Picard**, P. Huber, D. Bolliger, and A. Klapproth (2017) "Demand response optimized heat pump control for service sector buildings," *Computer Science - Research and Development*, doi: 10.1007/s00450-016-0320-9.

- N. Mathimaran, L. Falquet, K. Ineichen, **C. Picard**, D. Redecker, T. Boller, and A. Wiemken (2008) "Microsatellites for disentangling underground networks: Strain-specific identification of Glomus intraradices, an arbuscular mycorrhizal fungus," *Fungal Genetics and Biology*, doi: 10.1016/j.fgb.2008.02.009.

- N. Mathimaran, L. Falquet, K. Ineichen, **C. Picard**, D. Redecker, A. Wiemken, and T. Boller (2008) "Unexpected Vagaries of Microsatellite Loci in Glomus Intraradices: Length Polymorphisms Are Rarely Caused by Variation in Repeat Number Only," *New Phytologist*, doi: 10.2307/25150607.

- **C. Picard** and D. Picard (2004) "A web application to manage a database for liquid nitrogen tanks," *Immunology and Cell Biology*, doi: 10.1046/j.1440-1711.2004.01232.x.

Conference proceedings

- **C. Picard** and J. Schiffmann (2020) "Automated Design Tool for Automotive Control Actuators," *Proceedings of the ASME 2020 International Design Engineering Technical Conferences and Computers and Information in Engineering Conference*, Volume 11B: 46th Design Automation Conference (DAC), doi: 10.1115/DETC2020-22390.

- **C. Picard** and J. Schiffmann (2018) "Impacts of Constraints and Constraint Handling Strategies for Multi-objective Mechanical Design Problems," *Proceedings of the Genetic and Evolutionary Computation Conference (GECCO '18)*, doi: 10.1145/3205455.3205526.

- V. Mounier, **C. Picard**, and J. Schiffmann (2018) "Data-Driven Pre-Design Tool for Small Scale Centrifugal Compressors in Refrigeration," *Proceedings of the ASME Turbo Expo 2018: Turbomachinery Technical Conference and Exposition*, Volume 8: Microturbines, Turbochargers, and Small Turbomachines; Steam Turbines, doi: 10.1115/GT2018-76349.

Other oral presentations at conferences or seminars

- "Realistic Constrained Multiobjective Optimization Benchmark Problems From Design", Hot-off-the-press, at *the Genetic and Evolutionary Computation Conference (GECCO '21)*, July 2021, online.

- "Which professional skills do students learn in engineering team-based projects?", *EPFL coffee&learn*, May 2021, online.

- "Assessing Student Learning of Design and Project Management Skills in a Project-Based Course", at *the Swiss Faculty Development Network Conference*, Feb. 2019, Zürich, Switzerland.

Unpublished work

- **C. Picard** (2016) "Unobtrusive Energy Use Feedback: Review and Design Rules," iHomeLab, Hochschule Luzern T&A, SCCER Report, available upon request.

LANGUAGE SKILLS

French and Swiss German: mother tongue   English: proficient   German: advanced

REFERENCES

- Prof. Jürg Schiffman | LAMD, EPFL, Switzerland | jurg.schiffmann@epfl.ch | +41 21 695 45 48
- Prof. Faez Ahmed | DeCoDE, MIT, USA | faez@mit.edu | +1 (617) 253-6234
- Prof. Kristina Shea | EDAC laboratory, ETH Zürich, Switzerland | kshea@ethz.ch | +41 44 632 04 79
- Prof. Carlos A. Coello Coello | CINVESTAV IPN, Mexico, Mexico | carlos.coellocoello@cinvestav.mx | +52 55 5747 3800

WHEN OFF-DUTY

- Volunteer at Verein VoCHabular, Zürich, Switzerland for the development of an App to learn Swiss-German
- Walking, climbing, sledging, or skiing in the mountains
- Convinced bicycle rider for transportation or vacations
- Amateur violin and viola player (symphony orchestra or chamber music)