

Jakub Tkaczuk

THERMAL AND MECHANICAL ENGINEER

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🌐 jakubtkaczuk | 🎓 Jakub Tkaczuk



Summary

- Alumnus of the Marie Skłodowska-Curie International Training Network (EASITrain) and two Horizon 2020 programs
- **6 years experience in mechanical engineering and R&D of scientific instruments**
- **Specialized in mechanical system design, heat transfer calculations**

Competences

Engineering Mechanical and thermal analysis and design, Object Oriented Programming with Python, SolidWorks

Soft skills Dedicated team member but also independent worker, experienced in solving complex problems

Languages Advanced English and French, basic German, native Polish

Professional Experience

Mechanical engineer at **Global Health Engineering at ETH Zürich**

Zürich, Switzerland

ACQUIRED SKILLS: COLLABORATION, PROJECT MANAGEMENT

Jun. 2023 - present

- Supervising bachelor and master students
- Setting up a mechanical engineering laboratory

Postdoc in data science at **Idiap Research Institute**

Martigny, Switzerland

ACQUIRED SKILLS: EFFICIENT COMMUNICATION, PROJECT MANAGEMENT, PYTHON, SHELL SCRIPTING

Jan. 2022 - Jan. 2023

- Trained multilingual speech recognition models, developed online speech recognition engines
- Integrated models and auxiliary tools in a platform for the criminal investigators within the EU-funded ROXANNE project

Marie Skłodowska-Curie fellow at the **French Atomic Energy Commission (CEA)**

Grenoble, France

ACQUIRED SKILLS: COMPLEX PROBLEM-SOLVING, OPTIMIZATION WITH PYTHON, EXPERIMENTAL MEASUREMENTS

Mar. 2018 - May 2021

- Developed fluid property database for the mixtures of cryogenic fluids
- Experimentally verified mathematical models for the thermophysical properties of fluid mixtures

Visiting researcher at the **National Institute of Standards and Technology (NIST)**

Boulder, CO, USA

ACQUIRED SKILLS: ANALYTICAL THINKING, INDEPENDENCE, DATA ANALYSIS

Jan. 2019 - May 2019

- Analysed data for helium mixtures for the equations of state development

Mechanical Engineer at the **Technical University of Dresden**

Dresden, Germany

ACQUIRED SKILLS: WORKING UNDER PRESSURE, COLLABORATIVE PROBLEM SOLVING, PROCESS ENGINEERING

Feb. 2017 - Feb. 2018

- Designed the factory acceptance tests for the cryogenic moderator system for the European Spallation Source (ESS)
- Procured and tested components for the hydrogen system of ESS, including key elements, i.e., hydrogen circulation pumps

Cryogenic Engineer at the **French Atomic Energy Commission (CEA)**

Grenoble, France

ACQUIRED SKILLS: AUTONOMY, CURIOSITY, MECHANICAL AND THERMAL SYSTEM DESIGN

Mar. 2015 - May 2016

- Investigated alternative possibilities for the refrigeration of the RF cavities in the electron-positron Future Circular Collider
- Designed the magnetic refrigerator for 1.6 K refrigeration in laboratory applications

Science communicator in the **Copernicus Science Center**

Warsaw, Poland

ACQUIRED SKILLS: COLLABORATIVE WORK, PUBLIC SPEAKING, HEURISTICS

Mar. 2013 - Feb. 2015

- Running classes with high-school students and teachers in the laboratory of physics and the laboratory of robotics

Education

Doctoral degree in mechanical and cryogenic engineering

Grenoble, France

UNIVERSITÉ GRENOBLE ALPES

Mar. 2018 - Dec. 2021

Thesis: Equations of state for the thermodynamic properties of cryogenic mixtures ([link](#))

Engineering degree in mechanical engineering and thermodynamics

Warsaw, Poland

WARSAW UNIVERSITY OF TECHNOLOGY

Oct. 2008 - Oct. 2015

Thesis: Conceptual design of 1.6 K magnetic refrigerator for the Future Circular Collider

Scientific Publications

First author:

- **Autocrime - open multimodal platform for combating organized crime**
submitted to Forensic Science International: Digital Investigation
- **Equations of State for the Thermodynamic Properties of Binary Mixtures for Helium-4, Neon, and Argon**
Journal of Physical and Chemical Reference Data, 2020 (doi: 10.1063/1.5142275)
- **Magnetic Refrigeration down to 1.6 K for the Future Circular Collider e+e-**
Physical Review Accelerators and Beams, 2017 (doi: 10.1103/PhysRevAccelBeams.20.041001)
- **Measurements of the Joule-Thomson Coefficient for the Mixture of Helium-4 and Neon**
to be submitted to the Journal of Chemical & Engineering Data

Co-author:

- **HE-LHC: The High-Energy Large Hadron Collider**
The European Physical Journal Special Topics, 2019 (doi: 10.1140/epjst/e2019-900088-6)
- **FCC-hh: The Hadron Collider**
The European Physical Journal Special Topics, 2019 (doi: 10.1140/epjst/e2019-900087-0)
- **FCC Physics Opportunities**
The European Physical Journal C, 2019 (doi: 10.1140/epjc/s10052-019-6904-3)
- **FCC-ee: The Lepton Collider**
The European Physical Journal Special Topics, 2019 (doi: 10.1140/epjst/e2019-900045-4)
- **Final design, fluid dynamics and structural mechanical analysis of a liquid hydrogen moderator for ESS**
submitted to IOP Post-Conference Series, available on arXiv

Training in Research and Engineering

Google Project Management Professional Certificate

PROJECT INITIATION, PLANNING, AND EXECUTION. AGILE METHODS

online
Nov. 2022 - Feb. 2023

IBM AI Engineering Professional Certificate

DATA SCIENCE, BIG DATA, MACHINE LEARNING, AND DEEP LEARNING

online
Mar. 2020 - Jul. 2020

EASITrain Cryogenic Summer school

CRYOGENICS FOR LARGE SCIENTIFIC FACILITIES

Paris - Grenoble, France
Sep. 2019

European Society for Applied Superconductivity summer school

ACCELERATOR MAGNETS REVIEW AND DESIGN

Vienna, Austria
Aug. 2018

EASITrain Project Management Summer school

PROJECT MANAGEMENT, MEDIA, AND INNOVATION TRAINING

Vienna, Austria
Sep. 2018

European Course of Cryogenics

HELIUM REFRIGERATION, HYDROGEN LIQUEFACTION, AND LNG TRANSPORTATION

Germany - Poland - Norway
Aug. 2017

Conferences, Workshops & Presentations

- Data Collection Workshop with Law Enforcement Agencies 2022
- FCC Week 2019
- International Cryogenic Engineering Conference 2018
- FCC Week 2018
- Cryogenic Engineering Conference 2017
- Academia-Industry Matching Event on Superconductivity for Medical Applications 2016
- FCC Week 2016

Interests

- Alpinism, climbing, skiing, cycling, running
- Raspberry Pi and Do It Yourself projects, mechanics and electronics