

Lento Manickathan

AEROSPACE ENGINEER · POSTDOCTORAL RESEARCHER

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Summary

Aerospace Engineer with interests in high-performance computing, machine learning and computer vision techniques. My interests ranges from developing HPC applications in Python, Big Data analysis of experimental data, and administration of self-hosted linux servers.

Academic & Professional Experience

Empa (Swiss Federal Laboratories for Materials Science and Technology)

Zürich, Switzerland

POSTDOCTORAL RESEARCHER

Jun 2019 - Present

- Machine learning in quantitative flow visualization: Optical Flow CNN in PyTorch.
- Additional responsibilities: Lab HPC support and Fluid Tunnel support.

ETH Zurich

Zürich, Switzerland

SCIENTIFIC ASSISTANT

May 2015 - May 2019

- CFD, Wind tunnel, X-ray, Neutron radiography at Empa, PSI, ETHZ.
- Teaching assistant at ETHZ: *Application of CFD in buildings*.
- Supervision: *Praharsh Pai Raikar*.

Shell Global Solutions

Rijswijk, The Netherlands

RESEARCH INTERN

Sep 2012 - Feb 2013

- Investigating the combustion of hydrogen-rich Syngas fuel in gas turbine: Ansys Fluent

Education

ETH Zurich

Zürich, Switzerland

PH.D. IN MECHANICAL ENGINEERING

May 2015 - Jun. 2019

- **Thesis:** Impact of Vegetation on Urban Microclimate.
- **Advisor:** Prof. Dr. Jan Carmeliet
- Development of OpenFoam library: coupled soil-vegetation-air-radiation model in C++.
- Experimental study in wind tunnel: PIV, Infrared thermography.
- Big data analysis in python: X-ray tomography data and wind tunnel data.

TU Delft (Delft University of Technology)

Delft, The Netherlands

M.Sc. IN AEROSPACE ENGINEERING

Sep 2011 - Dec 2014

- **Major:** Aerodynamics and Wind Engineering.
- **Thesis:** Hybrid Eulerian-Lagrangian Vortex Particle Method: Developing a fast and accurate numerical method for the application of Vertical-Axis Wind Turbine (VAWT).
- **Advisor:** Prof. dr. ir. C.J. (Carlos) Simão Ferreira
- Python GPU accelerated CFD application development.

TU Delft (Delft University of Technology)

Delft, The Netherlands

B.Sc. IN AEROSPACE ENGINEERING

Sep 2008 - Aug 2011

- **Minor:** Wind Energy and Sustainability.
- **Thesis:** Designing a multi-purpose autonomous aerial monitoring aircraft.
- Design a UAV that can cope with severe weather conditions while performing a variety of sensing and monitoring tasks.

Extracurricular Activities

Leonardo Times Magazine

Delft, The Netherlands

EDITOR

Sep 2011 - Aug 2012

- Journal of the Society for Aerospace Engineering students, the VSV *Leonardo da Vinci* at the TU Delft.
- In charge of *Current Affairs* section.

TU Delft Formula Student

Delft, The Netherlands

POWERTRAIN ENGINEER

Sep 2009 - Jul 2010

- In charge of designing the powertrain intake system.
- Design and production of the carbon-fibre intake system.
- 2010 Formula Student Germany Champion.

Skills

SCIENTIFIC PROGRAMMING

CAD	Blender · CATIA
CFD	FEniCS · Fluent · OpenFOAM
Programming	C++ · MATLAB · Python · R · Shell
Python Libraries (HPC)	CuPy · Cython · Dask · H5py · MPI4py · Numba · NumPy · Pandas · SciPy
Python Libraries (ML)	PyTorch · Scikit-learn
Python Libraries (Plotting)	Dash · Matplotlib · Scikit-image

SOFTWARE DEVELOPMENT

Automation	Ansible
CI / CD	Git (GitHub, Gitlab) · Travis CI
Cloud	Amazon AWS (EC2)
Container	Docker · Kubernetes · Sarus · Vagrant
Database	InfluxDB · MariaDB
Embedded	Arduino · Raspberry Pi · NVIDIA Jetson Nano
HPC	SLURM
Markup / Typesetting	Jinja · LaTeX · Markdown · MkDocs · Vim
ML Libraries	PyTorch · Scikit-learn
OS	Linux (Debian, Red Hat) · MacOS · Windows
Web	CSS · HTML5 · Nginx

Languages

English · German · Dutch

Honors & Awards

2017	Outstanding Oral Presentation , 13 th Symposium on Urban Environment	Seattle, USA
2016	Young Best Researcher , 4 th International Conference on Countermeasures to Urban Heat Island	Singapore