# Vuong V. Trinh

Process Control and Optimization

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## Experience

**Associate Researcher**, **Dong A University Research Institute** since 2019

- Work with Kim-Phuc Tran (ENSAIT/GEMTEX), Anh-Tuan Mai (MOST) and Thu-Huong Truong (HUST) on real-time anomaly detection algorithms for industrial Big Data, e.g. wireless sensor networks;
- Familiar with Python (*Flask, Numpy, Pandas*), JS (*Highcharts*), SQL; Heroku (*Postgres*), AWS (*RDS, EC2*), Web (*Hugo, Netlify*); technical documentation (*Office, TeX, Inkscape, GIMP*).

**R&D Engineer**, **Benjamin Muyl Design Sarl** 2018

- Work with Benjamin Muyl (INEOS TEAM UK) on optimal control of sail yachts with direct collocation;
- Contribute to the software *META* by upgrading from Java / Matlab to Python using symbolic framework;
- Deploy Python (*CasADi*), version management (*Git*), production tools (*Bash*) and unit-tests.

**R&D Engineer**, **Commissariat à l'Énergie Atomique et aux Énergies Alternatives** 2014–2017

Supervisors: Mazen Alamir (CNRS/GIPSA-lab) and Patrick Bonnay (CEA-INAC/SBT) on advanced cryogenic process control and energetic optimization, within project ANR CRYOGREEN.

- Develop advanced model predictive control strategies, e.g. explicit constrained control and hierarchical distributed coordination, via machine learning, mathematical optimization and numerical algorithms;
- Model and control of compression stations and cryogenic refrigerators using *Simcryogenics*; experiments with SBT's station 400W 1.8K and CERN's 18kW 4.5K LHC facilities;
- Real-time nonlinear constrained control for Stirling engine in solar thermodynamic power plant;
- Intensive use of Matlab and C (*CPLEX, ACADO*); familiar with PLC/DCS/SCADA.

**Research Intern**, **Grenoble Images Parole Signal Automatique Laboratoire** 2014

Supervisors: Ioan Doré Landau and Luc Dugard (CNRS/GIPSA-lab), on active vibration control.

- Perform system identification, robust control design and experiments using Matlab and xPC Target;
- Laboratory instructor for adaptive control course within European Embedded Control Institute.

**Industrial Intern**, **Yazaki Corporation** 2011

- Analyse technical specifications and devise suitable solution for automotive wire production conveyors;
- Setup control box, relays and inverters; program PLC and HMI; deploy AutoCAD, Step7 and WinCC.

## Education

**M.S. Automation & Control Engineering**, Université Joseph Fourier & Grenoble INP 2013–2014

Mention: *good* (*MiSCIT Program*) | GPA: 15/20 | Rank: 3/18

**B.S. Automation & Control Engineering**, Hanoi University of Science and Technology 2007–2012

Mention: *good* (*Talented Engineer's Program*) | GPA: 3.17/4.00

## Awards

**Excellence Master Fellowship**, LabEx PERSYVAL-Lab 2013

**Vallet Scholarship for excellent academic performance**, Rencontres du Viêtnam 2008

**Double Prize in Physics (1st) and Maths (cons)**, Vietnam Mathematics & Youth Magazine 2007

## Languages

Vietnamese (*native*) | English (*fluent*: IELTS 6.5) | French (*basic*)

## Valorisation

**CS50's Introduction to Computer Science**, edX | Harvard University

**Six Sigma and Lean Processional Program**, edX | Technische Universität München

**TUM Lean Six Sigma Yellow Belt**, Technische Universität München | TUM School of Management

**Semaine d'Étude Maths-Info Entreprises**, Agence Maths Entreprises

PUBLICATIONS

**V. V. Trinh, M. Alamir, P. Bonnay and F. Bonne**, **Explicit model predictive control via nonlinear piecewise approximations**, in *Proceedings of the 10th IFAC Symposium in Nonlinear Control Systems*, Monterey, CA, USA, 2016.

**M. Alamir, V. V. Trinh and P. Bonnay**, **On the stabilization of fixed-point iterations arising in hierarchical control design**, in *Proceedings of the 20th IFAC World Congress*, Toulouse, France, 2017.

**M. Alamir, P. Bonnay, F. Bonne and V. V. Trinh**, **Fixed-point based hierarchical MPC control design for a cryogenic refrigerator**, *Journal of Process Control*, vol. 58, pp. 117-130, 2017.

**V. V. Trinh, K. P. Tran and A. T. Mai**, **Anomaly detection in wireless sensor networks via support vector data description with Mahalanobis kernels and discriminative adjustment**, in *Proceedings of the 2017 4th NAFOSTED Conference on Information and Computer Science*, Hanoi, Vietnam, 2017.

**V. V. Trinh, K. P. Tran and T. H. Truong**, **Data driven hyperparameter optimization of one-class support vector machines for anomaly detection in wireless sensor networks**, in *Proceedings of the 2017 International Conference on Advanced Technologies for Communications*, Quy Nhon, Vietnam, 2017. (*Best Paper Award Finalist*)

SERVICES

**Organization Team of JSIam**, Grenoble Innovation for Advanced New Technologies 2016

REFERENCES

**Kim-Phuc Tran** *Associate Professor in Automation and Industrial Informatics*
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