Alexander Bodard

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Mathematical Engineer and PhD candidate conducting research on Optimization, with applications in Control and Machine Learning. Experienced in algorithm design, theoretical analysis, and large-scale implementation. Seeking a cutting-edge research internship (**2026, anywhere**) in advanced optimization or ML applications.

EDUCATION

KU Leuven   Leuven, Belgium

PhD in Electrical Engineering; Supervised by Panos Patrinos & Masoud Ahookhosh   *Oct. 2022 – **Jan. 2027***

- *Research topic*: "Optimization beyond Lipschitz smoothness, with applications in Machine Learning and Control"
- *Research output*: Authored **6 peer-reviewed articles** and 3 preprints, presented at **top-tier conferences** worldwide (e.g. **NeurIPS**), had multiple successful **international collaborations**
- *Teaching*: Supervisor of two Master's theses (AI and Math. Eng.); Lead TA for Optimization for ML; Lead control expert for a class of ±100 students (Electrical Engineering Bachelor's project); TA for Optimization
- *Services*: Ombudsperson of the Master in AI, Member of the AI Programme Committee, Member of the Council of the Faculty of Engineering Science, Member of the SIAM student chapter Leuven

*MSc in Mathematical Engineering: **Magna Cum Laude** (83.03%)*   *2020 – 2022*

- Scientific Computing & Simulation, Data Science & AI, Control Theory, Cryptography
- Thesis: "Parallelized optimization of stochastic optimal control problems over scenario trees" (*published*): Designed a solver for stochastic OCPs that outperforms state-of-the-art general purpose solvers (**10x speedup**)

*BSc in Electrical Engineering and Computer Science: **Cum Laude***   *2017 – 2020*

EXPERIENCE

Keysight Technologies — *Research Intern*   Rotselaar, Belgium, 2021

- Enabled real-time uncertainty propagation for on-wafer S-parameter measurements; critical for THz applications. *Skills*: Python, Monte Carlo simulation

NXP Semiconductors — *Research Intern*   Leuven, Belgium, 2020

- Designed a novel out-of-SOC watchdog and successfully tested a first prototype on proprietary microprocessors. *Skills*: Python, C, Cryptographic protocols, Serial Communication protocols

Datacamp — *Software Engineering Intern*   Leuven, Belgium, 2019

- Extracted the authentication into a separate microservice for a major platform with **3M users**. *Skills*: Ruby on Rails, Git, CI/CD

VOLUNTEER ACTIVITIES

Student Innovations vzw — *Board member, Frontend Lead*   Leuven, Belgium, 2018 – 2022,

- Helped to build and maintain Quivr, the biggest student-run app in Belgium (**50k active users**). Managed the Frontend team (±5 people), and served as board member. *Skills*: React Native, Typescript, Git, Management

SELECTED PUBLICATIONS (SEE GOOGLE SCHOLAR FOR A COMPLETE LIST)

- Escaping saddle points without Lipschitz smoothness: the power of nonlinear preconditioning
  A. Bodard, P. Patrinos, NeurIPS, 2025, **spotlight (top 3.2%)**
- The inexact power augmented Lagrangian method for constrained nonconvex optimization
  A. Bodard, K. Oikonomidis, E. Laude, P. Patrinos, Transactions on Machine Learning Research (TMLR), 2025, *accepted*
- Second-order methods for provably escaping strict saddle points in composite nonconvex and nonsmooth optimization
  A. Bodard, M. Ahookhosh, P. Patrinos, SIAM Journal on Optimization, 2025, *submitted*

SKILLS

- **Languages**: Dutch, English, French
- **Programming Languages**: Python, Julia, also C/C++, Fortran, Java, Typescript, MATLAB
- **Technologies**: NumPy, PyTorch, Scikit-Learn, Matplotlib, JuMP, Git, Linux

AWARDS

- NeurIPS 2025, spotlight award (**top 3.2%**)
- Cybersecurity Challenge Belgium, 3x finalist, **6th** out of 253
- Euroavia Valencia Rocket Workshop (2018), **first place**. Built a rocket to bring payload to 200m altitude with live telemetry