Lukas Zierahn

Amsterdam · lukas.zierahn@gmail.com · +393757840242 · https://lukaszierahn.github.io/

ABOUT

I am a Postdoc jointly supervised by Wouter Koolen at CWI and Christina Katsimerou at Booking.com working on Best-Arm Identification in both theory and practice. Previously, I completed my PhD in Artificial Intelligence on adversarial bandits supervised by Nicolò Cesa-Bianchi and Gergely Neu under the ELLIS scheme. Furthermore, I have an extensive coding background as also shown by multiple industry internships and competitions.

SELECTED PUBLICATIONS

A Unified Analysis of Nonstochastic Delayed Feedback for Combinatorial Semi-Bandits, Linear Bandits, and MDPs — COLT 2023 & JMLR 2025
Lukas Zierahn, Dirk van der Hoeven, Tal Lancewicki, Aviv Rosenberg, Nicolò Cesa-Bianchi

Nonstochastic Contextual Combinatorial Bandits — AISTATS 2023
Lukas Zierahn, Dirk van der Hoeven, Nicolò Cesa-Bianchi, Gergely Neu

WORK EXPERIENCE

Postdoctoral Researcher — Dec 2024 - Present
Centrum Wiskunde & Informatica (CWI) and Booking.com — Amsterdam, Netherlands

- Developing theoretical guarantees and practical methods for Best-Arm Identification
- One project is on non-stationary bandits, where the expected payoff can change arbitrarily between timesteps while the best arm remains fixed and where previous approaches of using the GRLT provably fail
- A second project is on the expert setting, especially when the context are not available, a setting directly inspired by teams at Booking.com.

Applied Scientist Intern — Jul 2024 - Nov 2024
Amazon Web Services — Berlin, Germany

- Supporting the Amazon Q team by using practical Best-Arm Identification to quickly and efficiently evaluate prompts or full agents on the SWE-Bench baseline

Research Assistant to Professor Carsten Gerner-Beuerle — Oct 2020 - Jan 2021
University College London — London, UK

- Implementing and visualising a debt model in Python
- Interdisciplinary research by offering mathematical intuition and programming skills while collaborating with an economist
- Continuing work after concluding the contract and working towards a publication as a co-author

Research Intern with Professor Azadeh Khaleghi — Jun 2020 - Aug 2020
Lancaster University — Lancaster, UK

- Implementing a change-point estimation algorithm for highly dependent piece-wise stationary time-series
- Interfacing Golang with Python and R by compiling down to a C shared library that can be loaded by Cython and R
- Publishing the software as RChest on CRAN and as PyChest on PyPi
- Running extensive experiments comparing the package and underlying algorithm to other state of the art

Software Development Intern — Jun 2019 - Aug 2019
Softwire — London, UK

- Learning JavaScript/TypeScript in a 2 week boot camp followed by working in a team of 6 interns on a pro bono project for 8 weeks
- Rotating tasks in the team to learn full-stack development and to share knowledge

Research Intern — Aug 2018 - Sep 2018
Fraunhofer Institute for Open Communication Systems — Berlin, Germany

- Joining an existing team to simulate and visualise different modes of inter-car-communication by combining two existing Java based projects

Summer Schools and Academic Experience

Machine Learning Summer School 2024   Mar 2024
Okinawa Institute of Science and Technology (OIST) and RIKEN AIP   Okinawa, Japan

Reinforcement Learning Summer School 2023   Jun 2023 - Jul 2023
University Pompeu Fabra   Barcelona, Spain

- Co-organising the school by being in part responsible for the selection process and help ensuring a smooth experience for all participants

- Selected Topics: MDPs and Dynamic Programming, Concentration Inequalities, Contextual Bandits, Primal-Dual Methods, Regularization in RL

Summer School in Advanced Statistics 2022   Jul 2022
Bocconi University with University of Oxford and Imperial College London   Como, Italy

Education

PhD Artificial Intelligence   Nov 2021 - Oct 2024
University of Milan   Milan, Italy

- ELLIS PhD student supervised by Nicolò Cesa-Bianchi and Gergely Neu

- Research focus: Adversarial Multi-Armed Bandits, Combinatorial Bandits, Delay

MSc Data Science and Machine Learning Grade: Distinction   Sep 2020 - Sep 2021
University College London   London, UK

- Thesis: Multi-Agent Reinforcement Learning with Local Communication and Delayed Inter-Agent Weight Sharing

  - Creating a more stationary training environment by delaying the sharing of weights between copies of an agent, similar to learning with a target network to improve the efficiency in enabling coordination and communication

- Selected Modules: Reinforcement Learning (taught by Deepmind), Multi-agent Artificial Intelligence, Decision and Risk, Forecasting, Introduction to Deep Learning

BSc Mathematics Grade: 20.2/24 (First Class Honours)   Oct 2018 - Jun 2020
Lancaster University   Lancaster, UK

- Selected Modules: Multivariate Statistics in Machine Learning, Lebesgue Integration, Hilbert Spaces, Graph Theory, Number Theory, Combinatorics, Geometry of Curves and Surfaces

BSc Mathematics Transferred to Lancaster University   Sep 2017 - Jul 2018
University of Hamburg   Hamburg, Germany

Contests and Events

Hackathons

- The Junction   Helsinki, Finland, Oct 2019
- Hack the Police 4 *Invited to Scotland Yard after winning one of six prices*   London, UK, Sep 2019
- ICL Health Hack   London, UK, May 2019
- Fire Hack   Southampton, UK, March 2019

Tomorrow's Mathematicians Today   London, UK, Feb 2019

Preparing a presentation of an original mathematical topic of Good Circles about the arrangement of people such that conversation is easily possible and being voted one of the most enjoyable talks of the conference

4th National Place in Mathematics/Computer Science   Darmstadt, Germany, May 2018
Jugend Forscht (Youth Research Competition)

Using C++ and DirectX to create a simulation of prokaryotic cells, working independently and without direct supervision but incorporating feedback in each round of the competition