Eidgenössische Technische Hochschule Zürich
Swiss Federal Institute of Technology Zurich

Alexis Perakis
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NBER Innovation Research Boot Camp 2025

Zurich, February 3rd, 2025

Dear Members of the Selection Committee,

I am writing to express my strong interest in attending the fourth Innovation Research Boot Camp hosted by the NBER in Cambridge. I am currently a 5th year economics PhD student at ETH Zurich, Switzerland, where my research focuses on empirical work at the intersection of innovation and macroeconomics. In particular, I examine how technological advancements drive firm productivity and influence both aggregate and industry-specific growth. I am especially passionate about leveraging innovation research to inform policies that foster sustainable economic growth, in light of the secular stagnation and the environmental challenges ahead.

I believe that the boot camp's intensive coursework, high-caliber lectures from leading scholars, and opportunities for direct engagement with the innovation research community will provide invaluable insights and practical frameworks to advance my research. My academic background, combined with hands-on experience in empirical work, field experiments and machine learning techniques applied to very large datasets, has equipped me to contribute meaningfully to discussions and collaborative projects during the program. Additionally, Professor Elliott Ash, my co-advisor, will be sending a letter of recommendation to support my application.

Thank you for considering my application. I look forward to the possibility of contributing to and learning from the vibrant community at the NBER Innovation Research Boot Camp.

Sincerely,

Alexis Perakis



Alexis PERAKIS

ETH Zurich and KOF Swiss Economic Institute
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Fields of interests: Innovation Economics, Macroeconomics, Econometrics, Causal Inference, Natural Language Processing, Probabilistic Machine Learning

Relevant PhD courses: Heterogeneous Agent Models (Prof. Dean Corbae), Survey Data in Economics and Finance (Prof. Michael Weber), Causal Inference (Prof. Alberto Abadie), Deep Learning (Prof. Thomas Hofmann), Probabilistic Artificial Intelligence (Prof. Andreas Krause).

RESEARCH

Advisors: Prof. Jan-Egbert Sturm, Prof. Elliott Ash

Work in progress: "Innovation meets macroeconomics: investigating the secular stagnation through big data", "Innovation narratives in the economy"

Working papers:
Ash, E., H. Mikosch, A. Perakis and S. Sarferaz (2024), 'DP18792 Seeing and Hearing is Believing: The Role of Audiovisual Communication in Shaping Inflation Expectations', CEPR Discussion Paper No. 18792. CEPR Press, Paris & London.

Seminars and presentations: Journal of Monetary Economics/Swiss National Bank/Study Center Gerzensee Conference, Oxford Central Bank Communication RPN Workshop

Referee Service: Journal of Financial Stability; ACM Conference on Fairness, Accountability, and Transparency

POLICY WORK - ECONOMIC ANALYSES AND FORECASTS

Sturm, J. E., et al. (2024). Konjunkturanalyse: Prognose 2024/2025/2026 Gedämpfte europäische Konjunktur belastet Schweizer Aussichten. *KOF Analysen, 2024* (4), 1-20.

Sturm, J. E., et al. (2024). Konjunkturanalyse: Prognose 2024/2025/2026 Ausbleibender Aufschwung in Europa trübt Perspektiven der Schweizer Wirtschaft. *KOF Analysen, 2024* (3), 1-36.

Sturm, J. E., et al. (2024). Konjunkturanalyse: Prognose 2024/2025 Erholung in Europa stützt Schweizer Wirtschaft. *KOF Analysen, 2024* (2), 1-20.

Sturm, J. E., et al. (2024). Konjunkturanalyse: Prognose 2024/2025 Globale Konjunkturschwäche hemmt Schweizer Wirtschaft. *KOF Analysen, 2024* (1), 1-34.

Sturm, J. E., et al. (2023). Konjunkturanalyse: Prognose 2024/2025 Schweizer Wirtschaft im Sog der internationalen Konjunkturschwäche. *KOF Analysen, 2023* (4), 1-30.

Sturm, J. E., et al. (2023). Konjunkturanalyse: Prognose 2024/2025. Schweizer Konjunktur: Binnenwirtschaft stützt–Aussenhandel schwächelt. *KOF Analysen*, *2023* (3), 1-70.

Sturm, J. E., et al. (2023). Konjunkturanalyse: Prognose 2023/2024. Starke Beschäftigung trifft auf stockende Wirtschaft. *KOF Analysen*, *2023* (2), 1-26.

Sturm, J.-E., et al. (2019). Konjunkturanalyse: Prognose 2019/2020. Schweizer Wirtschaft kämpft mit schwierigen Rahmenbedingungen. *KOF Analysen*, *2019* (1), 1-70.

OTHER PUBLICATIONS

Perakis, A., Gorji, A., Jain, S., Chaitanya, K., Rizza, S., Konukoglu, E. (2021). Contrastive Learning of Single-Cell Phenotypic Representations for Treatment Classification. *In: Lian, C., Cao, X., Rekik, I., Xu, X., Yan, P. (eds) Machine Learning in Medical Imaging. MLMI 2021. Lecture Notes in Computer Science,* vol 12966. Springer, Cham., 565–575.

Vardner J. T., Ling, T., Russell, S. T., Perakis, A. M., He, Y., Brady, N. W., Kumar S. N., and West, A. C. (2017). Method of Measuring Salt Transference Numbers in Ion-Selective Membranes. *Journal of the Electrochemical Society,* 164.

WORK EXPERIENCE

KOF – Swiss Economic Institute, Zurich, Switzerland

06/2023 – Present *Expert: Monetary Policy and Consumer Prices*

- Carry out the inflation, interest rate and exchange rate quarterly forecasts for the Swiss economy.
- In charge of the KOF Monetary Policy Communicator.
- Contact person for newspaper/media enquiries about monetary policy and consumer prices.

07/2020 – Present *Scientific collaborator*

- Supervised 6 students: 3x master thesis, 1x semester project, 2x student internships.

EDUCATION

08/2020 – Present **ETH Zurich, Department of Management, Technology and Economics,** Switzerland
PhD Candidate in Economics

- Relevant courses: Heterogeneous Agent Models (Prof. Dean Corbae), Survey Data in Economics and Finance (Prof. Michael Weber), Causal Inference (Prof. Alberto Abadie), Deep Learning (Prof. Thomas Hofmann), Probabilistic Artificial Intelligence (Prof. Andreas Krause)

09/2017 – 05/2020 **ETH Zurich, Department of Management, Technology and Economics,** Switzerland
Master of Science (MSc), GPA: 5.48/6.00

- Master Thesis: "*Towards real-time innovation indicators – A natural language processing approach"*, Grade: 5.75/6.00

02/2017 – 08/2017 **Columbia University, Fu Foundation School of Engineering,** New York, NY, United States
Visiting Research Scholar, Department of Chemical Engineering

- Master Thesis: "*Materials and transport properties for membranes in new energy storage devices"*, Grade: 6.00/6.00

09/2015 – 08/2017 **Ecole Polytechnique Fédérale de Lausanne (EPFL), School of Engineering,** Switzerland
Master of Science (MSc), Materials Science and Engineering, GPA: 5.54/6.00

08/2014 – 07/2015 **Johns Hopkins University, Whiting School of Engineering,** Baltimore, MD, United States
Exchange year, *Materials Science and Engineering*, GPA: 3.91/4.00

09/2012 – 07/2015 **Ecole Polytechnique Fédérale de Lausanne (EPFL), School of Engineering,** Switzerland
Bachelor of Science (BSc), Materials Science and Engineering, GPA: 5.07/6.00

07/2012 **European School of Munich**, Munich, Germany
European Baccalaureate, Grade: 96%, *Valedictorian*

References available upon request

NBER Innovation Research Boot Camp 2025 - Research statement – Alexis Perakis

Current research:

My current research focuses on empirical methods to measure the impact of technological change: 1) on firm productivity and growth, 2) on industry-specific dynamics and 3) on aggregate growth. Using text-as-data methods in the spirit of Kelly et al. (2021), I investigate how firm-level productivity and performance are affected by the adoption of different technologies as well as what it means for productivity and growth at different levels of aggregation. I also use counterfactuals for innovation policy analysis to determine optimal investment and technology development strategies.

Future research:

My future research's common thread is the advancement of empirical methodologies to quantify and understand the multifaceted impact of technological innovations and expectations on firm performance, productivity, and dynamics. I plan to focus on two orthogonal directions. First, following the behavioural revolution (and slowly moving away from the Full Information Rational Expectations hypothesis), I will study how expectation formation and beliefs of economic agents can be incorporated more directly into innovation research. Following the vein of Keiller, de Paula, and Van Reenen (2024), who use firm expectations to estimate production functions, I will leverage my institute's long-running firm survey datasets (which include a proprietary innovation survey going back to 1990) to extract firm beliefs and behaviours about technology, competition, market structure, and human capital. Second, pursuing my current research and in the spirit of current seminal work (e.g. Kalyani et al., 2021; Acikalin et al., 2022; Caskurlu, Hoberg, and Phillips, 2023) I will leverage my experience and expertise in machine learning and AI to extract signals and elucidate processes from very large unstructured datasets about complex inter- and intra-firm dynamics and how these reshape firm behavior.

Why I am applying to the workshop:

I am eager to attend this workshop on innovation economics because it directly aligns with my research. The event offers a unique opportunity to deepen my understanding of the current state of the art and how the associated results influence economic growth and policy. I look forward to engaging with leading scholars, exchanging innovative ideas, and learning advanced methodologies to improve my work. I am confident that my active participation, excellence, and dedication to research will also contribute meaningful insights to my peers. The workshop will facilitate valuable networking, fostering collaborations and inspiring new research directions. Overall, my participation would significantly enrich my academic skills and further my research agenda in innovation economics.

References

Acikalin, Utku, Tolga Caskurlu, Gerard Hoberg, and Gordon M. Phillips. 'Intellectual Property Protection Lost and Competition: An Examination Using Large Language Models'. SSRN Scholarly Paper. Rochester, NY: Social Science Research Network, 17 November 2022. https://doi.org/10.2139/ssrn.4023622.

Caskurlu, Tolga, Gerard Hoberg, and Gordon M. Phillips. 'New Technology Sectoral Disruptions'. SSRN Scholarly Paper. Rochester, NY: Social Science Research Network, 1 December 2023. https://doi.org/10.2139/ssrn.4866566.

Kalyani, Aakash, Nicholas Bloom, Marcela Carvalho, Tarek Alexander Hassan, Josh Lerner, and Ahmed Tahoun. 'The Diffusion of New Technologies'. Working Paper. Working Paper Series. National Bureau of Economic Research, July 2021. https://doi.org/10.3386/w28999.

Norris Keiller, Agnes, Áureo de Paula, and John Van Reenen. 'Production Function Estimation Using Subjective Expectations Data'. Working Paper. Working Paper Series. National Bureau of Economic Research, July 2024. https://doi.org/10.3386/w32725.

Kelly, Bryan, Dimitris Papanikolaou, Amit Seru, and Matt Taddy. 'Measuring Technological Innovation over the Long Run'. *American Economic Review: Insights* 3, no. 3 (September 2021): 303–20. https://doi.org/10.1257/aeri.20190499.

Dear Members of the Selection Committee,

I am writing to recommend Alexis Perakis for the fourth Innovation Research Boot Camp at NBER. I know Alexis from co-advising his doctoral work and co-authoring with him on a survey experiment, along with two other senior researchers at ETH. The paper is currently under review at European Economic Review.

Thank you for considering Alexis's application.

Sincerely,
Elliott Ash