Kimon Antonakopoulos
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Laboratory for Information and Inference Systems (LIONS)
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Personal information

Name and Surname	Kimon ANTONAKOPOULOS
Place of Birth	Athens, Greece
Nationality	Greek

Research interests

Convex optimization; variational inequalities; Game theory; learning; parameter-agnostic methods; operations research

Education & Professional experience

2022–present **École Polytechnique Fédérale de Lausanne** Lausanne, Switzerland
Post-doctoral researcher
Mentor: *V. Cevher* (EPFL)
Project: *An optimization approach to Reinforcement Learning.*

2018–2022 **INRIA-Université Grenoble-Alpes** Grenoble, France
Doctorate of Philosophy (PhD)
Thesis: *Adaptive Methods for Optimization Without Lipschitz Requirements.*
Supervisors: *P. Mertikopoulos* (CNRS), *E. V. Belmega* (University Gustave Eiffel).
Phd Commitee:
M. Teboulle (Tel Aviv University) (rapporteur)
W. Hachem (University Gustave Eiffel) (rapporteur)
N. He (ETH Zürich) (examiner)
R. Cominetti (Adolfo Ibanez University) (examiner)
J. Malick (University Grenoble-Alpes) (president)

2015-2017 **Université Pierre-et-Marie-Curie (Paris VI)** Paris, France
Master of Science (M2), Mathématiques de la Modélisation (majeure Contrôle et Calcul des Variations).
Master Thesis: *A Continuous-Time approach to online convex optimization for Hilbert spaces, involving maximal strongly monotone operators.*
Supervisors: *R. Laraki* (CNRS), *P. Mertikopoulos* (CNRS)

2015 **National and Kapodistrian University of Athens** Athens, Greece
Department of Mathematics, Graduate Studies in Pure Mathematics.

2013 **National and Kapodistrian University of Athens** Athens, Greece
Department of Mathematics, Ptychion (M1 equivalent) in Mathematics.

Awards, grants, and fellowships

Awards and distinctions

2022 **NeurIPS 2022** – *Award nominee shortlist for "No-Regret Learning in Games with Noisy Feedback: Faster Rates and Adaptivity via Learning Rate Separation".*

2022 **ICML 2022** – *Long presentation (Top 2% of the submissions) for "UNDERGRAD: A Universal Black-Box Optimization Method With Almost Dimension-Free Convergence Rate Guarantees".*

2020 **ICLR 2020** – *Spotlight talk (Top 4% of the submissions) for "Online and Stochastic Optimization Beyond Lipschitz Continuity: A Riemannian Approach."*
Among the top-20 most discussed papers.

Fellowships and Grants

2018 **STSM grant**
Short term scientific mission (STSM) grant by the EU COST action GAMENET for a month-long research visit at *National Kapodistrian University of Athens, Athens, Greece.*

Research visits

2023 **University of California, Irvine** Irvine, USA
Visiting Researcher
Mentor: I. Panageas
Project: A bilevel perspective for games.

2018 **Universidad de Chile** Santiago, Chile
Visiting Researcher
Mentor: R. Cominetti.
Project: Accelerated methods beyond Lipschitz continuity assumptions.

2018 **National and Kapodistrian University of Athens** Athens, Greece
Visiting Researcher
Mentor: A.L. Moustakas.
Project: Online learning in games.

Research Networks and Service

Participation in Research Projects and Networks

2022 **ELLIS Phd Program** – *Evaluator for ELLIS Phd Program*

2020 **SMAI-MODE** – *member of the SMAI-MODE (the french analogue of SIAM)*

2018-2021 **GAMENET** – *member of the European Network for Game Theory*

Program Committees and Reviewing duties

Conferences – *reviewer for: Conference on Learning Theory (COLT), Intl. Conference on Learning Representations (ICLR), Intl. Conference for Neural Processing Information Systems (NeuRIPS), Intl. Conference on Machine Learning (ICML), Intl. Conference on Artificial Intelligence and Statistics (AISTATS), Eur. Conference on Machine Learning & Principles and Practice of Knowledge Discovery in Databases (ECML/PKDD)*

Journals – *reviewer for: SIAM Journal on Optimization (SIOPT), RAIRO Operations Research Journal, EURO Journal on Computational Optimization*

Teaching & Advising

Courses

Graduate level
- Online learning in games, (2023, EPFL), Teaching assistant.
- Mathematics of Data, (2022, EPFL), Teaching assistant.

Advising & Mentoring

Interns

- Anh-Duc Nguyen, National University of Singapore (NUS), (May 2023- September 2023)
  Topic: "*A Variational Inequality Perspective on Optimal Transport Problems*"
- Rayan Harfouche, Ecole Polytechnique Federal de Lausanne (EPFL), (July 2022-September 2022)
  Topic: "*Scalability for Adaptive Second Order Accelerated Methods*"

Talks & presentations

Conference organization

2023 **Mini-symposium in SIAM Conference on Optimization (OP23)** Seattle, USA
"*Adaptivity and Universality: First-Order Methods and Beyond.*"

Conference talks & Presentations

2023 **University of California, Irvine** Irvine, USA
"*Optimization beyond Lipschitz Requirements*"

2023 **SIAM Conference on Optimization (OP23)** Seattle, USA
"*Sifting Through The Noise: Universal First-Order Methods For Stochastic Variational Inequalities.*"

2023 **Intl. Conference on Learning Representations 2023** Kigali, Rwanda
"*Distributed Extra-Gradient with Optimal Complexity and Communication Guarantees.*"

2022 **Intl. Conference on Neural Processing Information Systems 2022** New Orleans, USA
"*Extra-Newton: A First Approach to Noise Adaptive Second-Order Accelerated Methods.*"

2022 **Intl. Conference on Neural Processing Information Systems 2022** New Orleans, USA
"*No-Regret Learning in Games with Noisy Feedback: Faster Rates and Adaptivity via Learning Rate Separation.*"

2022 **Intl. Conference on Machine Learning 2022 (Long Presentation)** Baltimore, USA
"*UNDERGRAD: A Universal Black-Box Optimization Method With Almost Dimension-Free Convergence Rate Guarantees.*"

2022 **Intl. Conference on Machine Learning 2022** Baltimore, USA
"*AdaGrad Avoids Saddle Points.*"

2021 **Intl. Conference on Neural Processing Information Systems 2021** Virtual
"*Sifting through the noise: Universal first-order methods for stochastic variational inequalities.*"

2021 **Intl. Conference on Neural Processing Information Systems 2021** Virtual
"*Adaptive First-Order Methods Revisited: Convex Minimization without Lipschitz Requirements.*"

2021 **Intl. Conference on Learning Representations 2021** Virtual
"*Adaptive Extra-Gradient Methods for Min-Max Optimization and Games.*"

2020 **Intl. Conference on Learning Representations 2020 (Spotlight)** Addis Ababa, Ethiopia
"*Online and Stochastic Optimization Beyond Lipschitz Continuity: A Riemannian Approach.*"

2020 **Journées SMAI-MODE 2020** Paris, France
"*Universal Guarantees for Online and Stochastic Programming beyond Lipschitz Continuity.*"

2019 **Intl. Conference on Neural Processing Information Systems 2019** Vancouver, Canada
"*An Adaptive Mirror-Prox Method for Variational Inequalities with Singular Operators.*"

2019 **PGMO Days 2019** Paris, France
"*Bregman proximal methods revisited for solving variational inequalities with singularities.*"

2019 **Intl. Conference on Continuous Optimization 2019** Berlin, Germany
"*Bregman proximal methods for stochastic variational inequalities with unbounded operators.*"

2019 **Laboratoire d' Informatique de Grenoble PhD Day 2019** Grenoble, France
"*Breaking the Lipschitz barrier in Online Convex Optimization.*"

2018 **Intl. Symposium on Dynamic Games 2018** Grenoble, France
"*On approximating saddle points in two-person zero- sum games with non-convex payoffs.*"

2018 **Journées SMAI-MODE 2018** Autrans, France
"*A primal-dual algorithm for finding zeros of random non-monotone operators in Hilbert spaces*"

Scientific Output and Publications

Dissertations

1. K. Antonakopoulos,"*Adaptive Methods for Optimization Problem beyond Lipschitz Continuity Requirements*", PhD Thesis, Université Grenoble-Alpes/INRIA, 2021.

2. K. Antonakopoulos,"*A Continuous-Time Approach to Online Convex Optimization for Hilbert Spaces Involving Maximal Strongly Monotone Operators.*", Master Thesis, Université Pierre-et-Marie-Curie (Paris VI), 2017.

Working papers

1. K. Antonakopoulos, S. Sabach, L. Viano, M. Hong, V. Cevher ,"*Adaptive Bilevel Optimization*" (submitted to Neurips 2023).

2. K. Antonakopoulos, L. Viano, E. Skoulakis, A. Kavis, Z. Wu, V. Cevher , "*Theoretical Guarantees for AdaGrad with Relative Biased Gradients*" (submitted to Neurips 2023). (submitted to Neurips 2023).

3. W. Xie, F. Latorre, K. Antonakopoulos, T. Pethick, V. Cevher, "*Improving SAM requires rethinking its optimization formulation*" (submitted to Neurips 2023). (submitted to Neurips 2023).

4. A. Ramezani-Kebrya, K. Antonakopoulos, A. Khisti, B. Liang, "*On the Generalization of Stochastic Gradient Descent with Momentum*" (submitted to Journal of Machine Learning (JMLR)).

5. D.-Q. Vu, K. Antonakopoulos and P. Mertikopoulos, "*Routing in an Uncertain World: Adaptivity, Efficiency and Equilibrium*" (https://arxiv.org/abs/2201.02985)

6. K. Antonakopoulos and P. Mertikopoulos, "*Bregman Proximal Methods for Stochastic Variational Inequalities with Singular operators.*" (in preparation)

Conference papers

1. K. Antonakopoulos, A. Ramezani-Kebrya, I. Krawczuk, J. Deschenaux, V. Cevher, "*Distributed Extra-Gradient with Optimal Complexity and Communication Guarantees* "*in ICLR 2023: Proceedings of the 11th International Conference on Learning Representations,* 2023.

2. K. Antonakopoulos, A. Kavis and V. Cevher, "*Extra-Newton: A First Approach to Noise Adaptive Second-Order Accelerated Methods,* "*in NeurIPS 2022: Proceedings of the 36th International Conference on Neural Processing Information Systems,* 2022.

3. A. Kavis, E. Skoulakis, K. Antonakopoulos, L. Tadesse Dadi and V. Cevher, "*Adaptive Stochastic Variance Reduction for Non-Convex Finite-Sum Minimization,*"*in NeurIPS 2022: Proceedings of the 36th International Conference on Neural Processing Information Systems,* 2022.

4. Y.-G. Hsieh, K. Antonakopoulos, V. Cevher and P. Mertikopoulos, "*No-Regret Learning in Games with Noisy Feedback: Faster Rates and Adaptivity via Learning Rate Separation,* "*in NeurIPS 2022: Proceedings of the 36th International Conference on Neural Processing Information Systems,* 2022.

5. K. Antonakopoulos, P. Mertikopoulos, G. Piliouras and X. Wang, "*AdaGrad Avoids Saddle Points*"*in ICML 2022: Proceedings of the 39th International Conference on Machine Learning,* 2022.

6. K. Antonakopoulos, D.-Q. Vu, V. Cevher, K.-Y Levy and P. Mertikopoulos, "*UNDERGRAD: A Universal Black-Box Optimization Method With Almost Dimension-Free Convergence Rate Guarantees,*"*in ICML 2022: Proceedings of the 39th International Conference on Machine Learning,* 2022.

7. K. Antonakopoulos, T. Pethick, A. Kavis, P. Mertikopoulos and V. Cevher, "*Sifting Through The Noise: Universal First-Order Methods For Stochastic Variational Inequalities,"in NeurIPS 2021: Proceedings of the 35th International Conference on Neural Processing Information Systems,* 2021.

8. K. Antonakopoulos and P. Mertikopoulos, "*Adaptive First-Order Methods Revisited: Convex Minimization without Lipschitz Requirements," in NeurIPS 2021: Proceedings of the 35th International Conference on Neural Processing Information Systems,* 2021.

9. D.-Q. Vu, K. Antonakopoulos and P. Mertikopoulos, "*Fast Routing under Uncertainty: Adaptive Learning in Congestion Games via Exponential Weights," in NeurIPS 2021: Proceedings of the 35th International Conference on Neural Processing Information Systems,* 2021.

10. Y.-G. Hsieh, K. Antonakopoulos and P. Mertikopoulos,"*Adaptive Learning in Continuous Games: Optimal Regret Bounds and Convergence to Equilibrium," in COLT 2021: Proceedings of 34th Annual Conference on Learning Theory*, 2021.

11. K. Antonakopoulos, E.V. Belmega and P. Mertikopoulos, "*Adaptive Extra-Gradient Methods for Min-Max Optimization and Games," in ICLR 2021: Proceedings of the 9th International Conference on Learning Representations,* 2021.

12. K. Antonakopoulos, E.V. Belmega and P. Mertikopoulos, "*Online and Stochastic Optimization Beyond Lipschitz Continuity: A Riemannian Approach," in ICLR 2020: Proceedings of the 8th International Conference on Learning Representations,* 2020.

13. K. Antonakopoulos, E.V. Belmega and P. Mertikopoulos, "*An Adaptive Mirror-Prox Method for Variational Inequalities with Singular Operators," in NeurIPS 2019: Proceedings of the 33rd International Conference on Neural Processing Information Systems,* 2019.