

Jakub Černý

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Research Interests

Decision making, game theory, bounded rationality, behavioral models, human-machine interactions, cooperation, coordination, persuasion, uncertainty, robustness, optimization.

Education

Doctor of Philosophy in Computer Science

School of Computer Science and Engineering

Thesis: Commitment and Coordination in Boundedly Rational Interactions

Fellowship: A*STAR SINGA Award

Nanyang Technological University

2019 – 2023

Master of Science in Discrete Models and Algorithms

Department of Applied Mathematics, Faculty of Mathematics and Physics

Thesis: Computational Bounded Rationality

Charles University

2014 – 2017

Master of Science in Artificial Intelligence

Department of Computer Science, Faculty of Electrical Engineering

Minor: Robotics

Thesis: Stackelberg Extensive-Form Correlated Equilibrium with Multiple Followers

Czech Technical University

2014 – 2016

Bachelor of Science in Computer Science

Department of Cybernetics, Faculty of Electrical Engineering

Minor: Mathematics

Thesis: Playing General Imperfect-Information Games Using Game-Theoretic Algorithms

Czech Technical University

2011 – 2014

Appointments

Postdoctoral Research Scientist

Department of Industrial Engineering and Operations Research

Funding: United States Department of the Navy, Office of Naval Research

Columbia University

08 / 2023 – now

Research Associate

Laboratory of Agent Mediated Intelligence

Funding: Singapore NRF/Industry Alignment Fund Pre-Positioning Programme

Nanyang Technological University

10–12 / 2018, 01–06 / 2023

Research Assistant

Collaborative Research Alliance: CMU/UTEP/CTU

Funding: United States Army, Army Research Laboratory

Czech Technical University

07 / 2016 – 09 / 2018

Awards and Honors

A*STAR SINGA and Merit Awards Laureate

Fellowship with full tuition coverage and a monthly allowance

First laureate of the Merit Award in the history of more than 900 awardees

Singaporean Agency for Science, Technology and Research

2019–2023

Outstanding Thesis Award Laureate

Award for an exceptional master thesis in the field of cyber-security

Cisco Systems

2016

ACM Spy Award Nominee

Master thesis selected as one of the top 10 university-wide

Association for Computing Machinery

2016

FEE Dean's Awards Laureate

MSc/BSc studies completed summa cum laude, ranking in the top 6%/2% students school-wide

Czech Technical University

2016 & 2014

FEE Dean's List

Consistently honored with merit scholarships in recognition of outstanding academic achievements

Czech Technical University

2012 – 2015

Research Visits and Internships

Visiting Research Scholar

Sigma Laboratory, hosted by Prof. Xu

Project: Persuading short-sighted Bayesian actors in partially observable sequential interactions.

University of Chicago

09 – 12 / 2022

Research Intern

AI Research Laboratory, hosted by Dr. Somol

Project: Discovering human-centered explainable attack strategies in computer attacks behavioral data.

Gen Digital (NortonLifeLock + Avast Software)

02 – 06 / 2021

Visiting Researcher

Adelphi Laboratory Center, hosted by Dr. Colbert and Dr. Ben-Asher

Project: Computing defender strategies against behavioral learning models of attackers in computer networks.

US Army Research Laboratory

06 / 2018

Visiting Researcher

Dynamic Decision Making Laboratory, hosted by Prof. Gonzalez

Project: Modeling cyber security honeypot scenarios via game theory.

Carnegie Mellon University

06 / 2017

Visiting Researcher

Intelligent Agents and Strategic Reasoning Laboratory, hosted by Prof. Kiekintveld

Project: Modeling cyber security honeypot scenarios via game theory.

University of Texas at El Paso

06 / 2017

Publications

Preprints

*Unified Perspective on Deep Equilibrium Finding (X. Wang, **J. Černý**, S. Li, Z. Yin, H. Chan and B. An).*

*Offline Equilibrium Finding (S. Li, X. Wang, **J. Černý**, Y. Zhang, H. Chan and B. An).*

*Critical Good Distribution Systems (**J. Černý**, A. Jedličková, M. Loebl and D. Sychrovský).*

Journal papers

*The Dark Triad and Strategic Resource Control in a Competitive Computer Game (S. Curtis, A. Basak, J. Carre, B. Božanský, **J. Černý**, N. Ben-Asher, M. Gutierrez, D. Jones and C. Kiekintveld).* In *Personality and Individual Differences*. Elsevier, 2020.

Conference papers

*Layred Graph Security Games (**J. Černý**, C. K. Ling, C. Kroer and G. Iyengar).* In *Proceedings of the Thirty-Third International Joint Conference on Artificial Intelligence*. IJCAI Press, 2024.

*Generalist Pursuer for Pursuit-Evasion Problems (P. Li, S. Li, X. Wang, **J. Černý**, Y. Zhang, S. McAleer, H. Chan and B. An).* In *Proceedings of 23rd International Conference on Autonomous Agents and Multiagent Systems*. IFAAMAS, 2024.

*Reducing Optimism Bias in Incomplete Cooperative Games (F. Úradník, D. Sychrovský, **J. Černý** and M. Černý).* In *Proceedings of 23rd International Conference on Autonomous Agents and Multiagent Systems*. IFAAMAS, 2024.

*Price of Anarchy in a Double-Sided Critical Goods Distribution System (D. Sychrovský, **J. Černý**, S. Lichau and M. Loebl).* In *Proceedings of 22nd International Conference on Autonomous Agents and Multiagent Systems*. IFAAMAS, 2023.

*Solving Pursuit-Evasion Games Using Pre-Trained Strategies (S. Li, X. Wang, Y. Zhang, H. Chan, **J. Černý** and B. An).* In *Proceedings of 37th AAAI Conference on Artificial Intelligence*. AAAI Press, 2023.

*Quantal Correlated Equilibrium in Normal Form Games (**J. Černý**, B. An and A. N. Zhang).* In *Proceedings of the 2022 ACM Conference on Economics and Computation*. ACM, 2022.

*Computing Quantal Stackelberg Equilibrium in Extensive-Form Games (**J. Černý**, V. Lisý, B. Božanský and B. An).* In *Proceedings of 35th AAAI Conference on Artificial Intelligence*. AAAI Press, 2021.

*Computing Ex Ante Coordinated Team-Maxmin Equilibria in Zero-Sum Multiplayer Extensive-Form Games (Y. Zhang, B. An and **J. Černý**).* In *Proceedings of 35th AAAI Conference on Artificial Intelligence*. AAAI Press, 2021.

*Complexity and Algorithms for Exploiting Quantal Opponents in Large Two-Player Games (D. Milec, **J. Černý**, V. Lisý and B. An).* In *Proceedings of 35th AAAI Conference on Artificial Intelligence*. AAAI Press, 2021.

*Dinkelbach-Type Algorithm for Computing Quantal Stackelberg Equilibrium (**J. Černý**, V. Lisý, B. Božanský and B. An).* In *Proceedings of the 29th International Joint Conference on Artificial Intelligence*. IJCAI Press, 2020.

Finite State Machines Play Extensive-Form Games (J. Černý, B. Božanský and B. An). In Proceedings of the 2020 ACM Conference on Economics and Computation. ACM, 2020.

Evaluating Models of Human Behavior in an Adversarial Multi-Armed Bandit Problem (M. Gutierrez, J. Černý, N. Ben-Asber, E. Aharonov-Majar, A. Basak, B. Božanský, C. Kiekintveld and C. Gonzalez). In Proceedings of the 41th Annual Meeting of the Cognitive Science Society, 2019.

Incremental Strategy Generation for Stackelberg Equilibria in Extensive Form Games (J. Černý, B. Božanský and C. Kiekintveld). In Proceedings of the 2018 ACM Conference on Economics and Computation. ACM, 2018.

An Initial Study of Targeted Personality Models in the FlipIt Game (A. Basak, J. Černý, M. Gutierrez, S. Curtis, C. Kamboua, D. Jones, B. Božanský and C. Kiekintveld). In Proceedings of the 2018 Conference on Decision and Game Theory for Security, 2018.

Externally Funded Research Projects

United States Department of the Navy, Office of Naval Research

PIs: C. Kroer, G. Iyengar

Red Team/Blue Team Games with Contingency Planning and Adversarial Team Games

Total funding: \$1,226,862.00

Role: Contractor / Postdoctoral Research Scientist at Columbia University

United States Army, Army Research Laboratory

PIs: C. Kiekintveld, D. Jones, B. Božanský, N. Cristin

Defeating the Dark Triad in Cyber-security Using Game Theory

Total funding: \$1,350,000.00

Role: Contractor / Research Assistant at Czech Technical University

Teaching Experience

Teaching Assistant in Parallel and Distributed Computing

Czech Technical University

Department of Computer Science

02 – 05 / 2018

Collaborated in crafting tutorials for a new course, contributing to the creation of assignments and implementing automated assessments.

Related Skills

Programming: Python; C++; Java; T_EX; grid computing on computer clusters with PBSPro, Slurm

Optimization: Linear, convex and non-convex optimization with Baron, CPLEX and Gurobi

Modeling: Formal cognitive modeling of rationality; process modeling using one-shot and sequential games

Refereeing

Journals: Games and Economic Behavior; Journal of Artificial Intelligence Research; Artificial Intelligence; Autonomous Agents and Multi-Agent Systems; Dynamic Games and Applications

Conferences: AAMAS (+GAIW/OptLearnMAS); AAAI; DAI; EC; GameSec; ICLR*; ICML; IJCAI; NeurIPS; WINE

* Outstanding reviewer award in 2022

References

Prof. Garud Iyengar

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Prof. Christian Kroer

Department of Industrial Engineering and Operations Research, Columbia University

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Prof. Bo An

School of Computer Science and Engineering, Nanyang Technological University

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Prof. Haifeng Xu

Department of Computer Science, University of Chicago

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Prof. Martin Loebel

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