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 — **Nanyang Technological University**
School of Computer Science and Engineering — *2019 – 2023*
Thesis: Commitment and Coordination in Boundedly Rational Interactions
Fellowship: A*STAR SINGA Award

Master of Science in Discrete Models and Algorithms — **Charles University**
Department of Applied Mathematics, Faculty of Mathematics and Physics — *2014 – 2017*
Thesis: Computational Bounded Rationality

Master of Science in Artificial Intelligence — **Czech Technical University**
Department of Computer Science, Faculty of Electrical Engineering — *2014 – 2016*
Minor: Robotics
Thesis: Stackelberg Extensive-Form Correlated Equilibrium with Multiple Followers

Bachelor of Science in Computer Science — **Czech Technical University**
Department of Cybernetics, Faculty of Electrical Engineering — *2011 – 2014*
Minor: Mathematics
Thesis: Playing General Imperfect-Information Games Using Game-Theoretic Algorithms

APPOINTMENTS

Postdoctoral Research Scientist — **Columbia University**
Department of Industrial Engineering and Operations Research — *08 / 2023 – now*
Funding: United States Department of the Navy, Office of Naval Research

Research Associate — **Nanyang Technological University**
Laboratory of Agent Mediated Intelligence — *10–12 / 2018, 01–06 / 2023*
Funding: Singapore NRF/Industry Alignment Fund Pre-Positioning Programme

Research Assistant — **Czech Technical University**
Collaborative Research Alliance: CMU/UTEP/CTU — *07 / 2016 – 09 / 2018*
Funding: United States Army, Army Research Laboratory

AWARDS AND HONORS

GameSec'24 Best Paper Award Laureate — **Conference on Game Theory and AI for Security**
Award for our paper Contested Logistics: A Game-Theoretic Approach — *2024*

A*STAR SINGA and Merit Awards Laureate — **Singaporean Agency for Science, Technology and Research**
Fellowship with full tuition coverage and a monthly allowance — *2019–2023*
First laureate of the Merit Award in the history of more than 900 awardees

Cisco Outstanding Thesis Award Laureate — **Cisco Systems**
Award for an exceptional master thesis in the field of cyber-security — *2016*

ACM Spy Award Nominee — **Association for Computing Machinery**
Master thesis selected as one of the top 10 university-wide — *2016*

CTU FEE Dean's Awards Laureate and Dean's Lists Honoree — **Czech Technical University**
MSc/BSc studies completed summa cum laude (top 6%/2% school-wide), consistently on Dean's list — *2012 – 2016*

RESEARCH VISITS AND INTERNSHIPS

Visiting Research Scholar **University of Chicago**
Sigma Laboratory, hosted by Prof. Xu *09 – 12 / 2022*
Project: Persuading short-sighted Bayesian actors in partially observable sequential interactions.

Research Intern **Gen Digital (NortonLifeLock + Avast Software)**
AI Research Laboratory, hosted by Dr. Somol *02 – 06 / 2021*
Project: Discovering human-centered explainable attack strategies in computer attacks behavioral data.

Visiting Researcher **US Army Research Laboratory**
Adelphi Laboratory Center, hosted by Dr. Colbert and Dr. Ben-Asher *06 / 2018*
Project: Computing defender strategies against behavioral learning models of attackers in computer networks.

Visiting Researcher **Carnegie Mellon University**
Dynamic Decision Making Laboratory, hosted by Prof. Gonzalez *06 / 2017*
Project: Modeling cyber security honeypot scenarios via game theory.

Visiting Researcher **University of Texas at El Paso**
Intelligent Agents and Strategic Reasoning Laboratory, hosted by Prof. Kiekintveld *06 / 2017*
Project: Modeling cyber security honeypot scenarios via game theory.

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).*

GUARD: Constructing Realistic Two-Player Matrix and Security Games for Benchmarking Game-Theoretic Algorithms (N. Krever, ***J. Černý****, M. Blanchard and C. Kroer).*

JOURNAL PAPERS

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

CONFERENCE PAPERS

Commitment to Sparse Strategies in Two-Player Games (S. Afiouni, ***J. Černý****, C. K. Ling and C. Kroer).* In Proceedings of Thirty-Ninth AAAI Conference on Artificial Intelligence. AAAI Press, 2025.

*Contested Logistics: A Game-Theoretic Approach (****J. Černý****, C. K. Ling, D. Chakrabarti, J. Zhang, G. Farina, C. Kroer and G. Iyengar).* In Proceedings of the 2024 Conference on Decision and Game Theory for Security. Springer, 2024.

*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. Bošanský 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. Bošanský 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. Bošanský 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-Asher, E. Aharonov-Majar, A. Basak, B. Bošanský, 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. Bošanský 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.Kamhoua, D. Jones, B. Bošanský 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: Postdoctoral Research Scientist at Columbia University

United States Army, Army Research Laboratory **PIs: C. Kiekintveld, D. Jones, B. Bošanský, N. Cristin**
Defeating the Dark Triad in Cyber-security Using Game Theory
Total funding: $1,350,000.00
Role: 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; TEX; 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