Jakub Černý

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Research Interests

Decision making, multi-agent systems, bounded rationality, behavioral models, human-machine interactions, cooperation, coordination, persuasion, uncertainty, robustness, optimization.

Education

Nanyang Technological University — **School of Computer Science and Engineering**
PhD., Complex Systems — *2019 – 2023*
Thesis: Commitment and Coordination in Boundedly Rational Interactions

Charles University — **Faculty of Mathematics and Physics**
MSc., Applied Mathematics – Discrete Models and Algorithms — *2014 – 2017*
Thesis: Computational Bounded Rationality

Czech Technical University in Prague — **Faculty of Electrical Engineering**
MSc., Artificial Intelligence, minor: Robotics — *2014 – 2016*
Thesis: Stackelberg Extensive-Form Correlated Equilibrium with Multiple Followers

Czech Technical University in Prague — **Faculty of Electrical Engineering**
BSc., Computer Science, minor: Mathematics — *2011 – 2014*
Thesis: Playing General Imperfect-Information Games Using Game-Theoretic Algorithms

Appointments and Internships

University of Chicago — **Sigma Lab (Prof. Xu)**
Visiting research scholar — *09 / 2022 – 2023*
Project: Persuading short-sighted Bayesian actors in partially observable sequential interactions.

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

Nanyang Technological University — **Agent Mediated Intelligence Lab (Prof. An)**
Research associate — *10 / 2018 – 01 / 2019*
Project: Integrating the quantal response model of bounded rationality into large-scale general-sum dynamic games.

Czech Technical University — **US ARL Research Alliance**
Research assistant, member of a CMU / UTEP / CTU group — *07 / 2016 – 09 / 2018*
Project: Defeating the dark triad in cyber security via game theory.

US DEVCOM Army Research Laboratory — **Adelphi Laboratory Center (Dr. Colbert, Dr. Ben-Asher)**
Visiting researcher / intern — *06 / 2018*
Project: Computing defender strategies against behavioral learning models of attackers in computer networks.

Carnegie Mellon University, University of Texas at El Paso — **(Prof. Gonzalez, Prof. Kiekintveld)**
Visiting Collaborative Research Alliance researcher — *06 / 2017*
Project: Modeling cyber security honeypot scenarios via game theory.

Czech Technical University — **Agent Technology Center (Prof. Bošanský)**
Research assistant — *01 – 12 / 2015*
Project: Designing a general interaction description language for computational game theory.

Publications

Preprints and working papers

*Discrete-Time Stochastic Multi-Player Stopping Games with Affine Payoffs (G. Bouveret, **J. Černý** and A. Neufeld).*

*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).*

*Quantal Correlated Equilibrium in Extensive Form Games (**J. Černý**, B. An and A. N. Zhang).*

*Partially Observable Markov Persuasion Process (M. Hattrup, **J. Černý** and H. Xu).*

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

*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. AAAI, 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.

Workshop papers and posters

AAMAS 2019: International Workshop on Optimization in Multiagent Systems (OptMAS)

EC 2019: Workshop on Machine Learning in the Presence of Strategic Behavior

ICALP 2017: Game Solving: Theory and Practice Workshop

US ARL Bootcamp 2017, 2018: Cyber Security Collaborative Research Alliance Poster Sessions

Awards and Honors

A*STAR SINGA Award and Merit Award Laureate
PhD scholarship and monthly allowance for pursuing studies in Singapore   *2018*
First laureate of the Merit Award in the history of >900 scholarship awardees.

Cisco Outstanding Thesis Award Laureate
Award for best master thesis related to security   *2016*

ACM Spy Award Nominee
Master thesis shortlisted among top 10 CTU theses   *2016*

CTU FEE Dean's Awards Laureate
MSc/BSc studies finished summa cum laude – among top 6%/2% of students (faculty-wide)   *2016/2014*

CTU Merit Scholarship Recipient
Scholarship for excellent study results by Czech Technical University   *2012 – 2015*

Teaching Experience

CTU: Parallel and Distributed Computing
Teaching assistant   *02 – 05 / 2018*
Co-designed the tutorials for an entirely new course from scratch, including assignments and automatic evaluation.

Related Skills

Programming: Python; C++; Java; TEX

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

Problem-Solving: Constructing optimal decisions as equilibria; linear, convex and non-convex optimization with CPLEX; grid computing on supercomputers using PBSPro, Slurm

Refereeing: AAMAS/GAIW 2018 – 2021; AAAI 2021–2023; DAI 2020; EC 2019 – 2022; ICLR 2022*–2023; ICML 2021; IJCAI 2019–2020; NeurIPS 2020 – 2022; WINE 2020

* Outstanding reviewer award

Languages

Czech: Native proficiency   **French**: Elementary proficiency

English: Prof. working proficiency   **Japanese**: Elementary proficiency

References

Prof. Bo An   boan@ntu.edu.sg
School of Computer Science and Engineering, Nanyang Technological University   *Tel. +65 6790 5389*

Prof. Haifeng Xu   haifengxu@uchicago.edu
Department of Computer Science, University of Chicago

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