

Jakub Černý

500 W 120th St, 535 Mudd – New York – NY 10027

jakub@cernyjakub.com • cernyjakub.com

Research Interests

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

Education

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

Charles University <i>MSc., Applied Mathematics – Discrete Models and Algorithms</i>	Faculty of Mathematics and Physics 2014 – 2017
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Thesis: Computational Bounded Rationality

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

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

Appointments and Internships

Columbia University <i>Postdoctoral research scientist</i>	IEOR Department (Prof. Kroer, Prof. Iyengar) 08 / 2023 – now
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Project: Red and blue team games.

University of Chicago <i>Visiting research scholar</i>	Sigma Lab (Prof. Xu) 09 – 12 / 2022
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Project: Persuading short-sighted Bayesian actors in partially observable sequential interactions.

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

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

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

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

Carnegie Mellon University, University of Texas at El Paso <i>Visiting Collaborative Research Alliance researcher</i>	Prof. Gonzalez, Prof. Kiekintveld 06 / 2017
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Project: Modeling cyber security honeypot scenarios via 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).
- Critical Good Distribution Systems* (**J. Černý**, A. Jedličková, M. Loebl and D. Sychrovský).
- Generalist Pursuer for Pursuit-Evasion Problems* (P. Li, S. Li, X. Wang, **J. Černý**, Y. Zhang, S. McAleer, H. Chan, B. An).

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; T_EX

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/OptLearnMAS 2018 – 2023; AAAI 2021–2023; DAI 2020; EC 2019 – 2023; ICLR 2022*–2023; ICML 2021; IJCAI 2019–2023; 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

School of Computer Science and Engineering, Nanyang Technological University

boan@ntu.edu.sg

Tel. +65 6790 5389

Prof. Haifeng Xu

Department of Computer Science, University of Chicago

haifengxu@uchicago.edu

Prof. Ariel Neufeld

Division of Mathematical Sciences, Nanyang Technological University

ariel.neufeld@ntu.edu.sg

Tel. +65 6592 1799

Prof. Martin Loeb

Department of Applied Mathematics, FMP, Charles University

loeb@kam.mff.cuni.cz

Tel. +420 22191 4233