

Jakub Černý

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Research Interests

Artificial intelligence, multi-agent systems, computational game theory, decision making, bounded rationality, uncertainty, robustness, security, optimization, coordination.

Education

Nanyang Technological University <i>PhD., Complex Systems</i> Thesis: Commitment and Correlation in Boundedly Rational Interactions	School of Computer Science and Engineering 2019 – 2023
Charles University <i>Mgr. (MSc.), Applied Mathematics – Discrete Models and Algorithms</i> Thesis: Computational Bounded Rationality	Faculty of Mathematics and Physics 2014 – 2017
Czech Technical University in Prague <i>Ing. (MSc.), Artificial Intelligence, minor: Robotics</i> Thesis: Stackelberg Extensive-Form Correlated Equilibrium with Multiple Followers	Faculty of Electrical Engineering 2014 – 2016
Czech Technical University in Prague <i>Bc. (BSc.), Computer Science, minor: Mathematics</i> Thesis: Playing General Imperfect-Information Games Using Game-Theoretic Algorithms	Faculty of Electrical Engineering 2011 – 2014

Research Experience

Agent Mediated Intelligence Research Group at NTU <i>Research Associate</i> Research project: Solving Large-Scale General-Sum Dynamic Games.	10/2018 – 01/2019
Artificial Intelligence Center at CTU <i>Research Assistant, coop. with CMU and UTEP</i> Research project: Defeating the Dark Triad in Cyber Security Using Game Theory.	US Army Research Lab Research Alliance 07/2016 – 09/2018
Agent Technology Center at CTU <i>Research Assistant</i> Research project: General Game Description Language for Computational Game Theory.	01 – 12/2015

Research Visits and Internships

NortonLifeLock / Avast Software (Dr. Somol) <i>Research internship</i>	02 – 06/2021
US Army Research Laboratory at Adelphi (Dr. Colbert, Dr. Ben-Asher) <i>Research internship</i> Computing defender strategies against behavioral learning models of attackers in computer networks.	06/2018
CMU: CyLab (Prof. Christin) and DDM Lab (Prof. Gonzalez); UTEP (Prof. Kiekintveld) <i>Research Alliance visit</i> Modeling cyber security scenarios via game theory.	06/2017
Agent Technology Center at CTU (Prof. Božanský) <i>Research internship</i> Developing double-oracle game-theoretic algorithms based on reverse game tree traversal.	08 – 09/2014

Publications

Working papers.....

Correlation in Boundedly Rational Normal Form Games (J. Černý, B. An, A. N. Zhang). 2022.

Discrete-Time Stochastic Multi-Player Stopping Games with Affine Payoffs (G. Bouveret, J. Černý, A. Neufeld). 2022.

Unified Perspective on Deep Equilibrium Finding (X. Wang, J. Černý, S. Li, Z. Yin, H. Chan, B. An). 2022.

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.....

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, 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. Bošanský, 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

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-created the tutorials for a new course from scratch, including homeworks and automatic evaluation.

Related Skills

Programming: C++; Python; Java; Matlab; Prolog; Scheme; Haskell; 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 2018 – 2021; AAAI 2021; DAI 2020; EC 2019 – 2022; ICLR 2022; ICML 2021; IJCAI 2019, 2020; NeurIPS 2020, 2021; WINE 2020

Languages

Czech: Native proficiency

French: Elementary proficiency

English: Prof. working proficiency

Japanese: Elementary proficiency

Certificates

GRE: Quantitative: 164/170, Verbal: 158/170

TOEFL: Total: 111/120; Reading: 30/30, Listening: 30/30, Speaking: 26/30, Writing: 25/30

References

Prof. Bo An

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Prof. Christopher D. Kiekintveld

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