Dongge **Han**

PHD @ OXFORD · MULTIAGENT SYSTEMS, REINFORCEMENT LEARNING, GAME THEORY

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Education

University of Oxford

PHD IN COMPUTER SCIENCE (Supervisors: PROF. MICHAEL WOOLDRIDGE, PROF. ALEX ROGERS)   *2016 - 2022*
  THESIS: GAME-THEORETIC PAYOFF ALLOCATION IN MULTIAGENT ML SYSTEMS

MSc IN COMPUTER SCIENCE (DISTINCTION)   *2015 - 2016*

Hong Kong University of Science and Technology (HKUST)

BSc IN PHYSICS - PHYSICS AND MATH OPTION, MINOR IN IT. (FIRST CLASS HONOURS)   *2011 - 2015*

ACADEMIC EXCHANGE @ EPFL   *2014*

Research Projects ———————————— The following are my first-authored research projects.

REINFORCEMENT LEARNING (RL)   *2018 -*

- **Multiagent Model-based Credit Assignment for Continuous Control.** (AAMAS'22 Oral, Paper Link, Demo Link)
  Many real-world robotic tasks require decentralised and continuous control which can be modelled by coopera-
  tive multiagent RL systems. However, agents in such systems often receive a global reward rather than individual
  credits which impede efficient learning and coordination. We present a game-theoretic credit assignment frame-
  work using semivalues and model-based RL for decentralised continuous control.
- **MDP Abstraction with Successor Features** (AAAI'22 Workshop RL in Games, Paper Link, Poster Link) Abstrac-
  tion is a key enabler for generalisation in RL. We proposed abstract options which can be transferred via Inverse
  RL, and applied to the game of Minecraft. Moreover, we propose successor homomorphism, which combines
  temporal abstraction (options) and state abstraction to produce abstract SMDP's useful for efficient planning.
- **Multi-agent Hierarchical RL with Dynamic Termination** (AAMAS'19 Poster, PRICAI'19 Oral, Paper Link,
  Poster Link) In a multiagent system, an agent's optimal policy depends on the policies of other agents. The op-
  tions framework allows agents to take into account others' behaviours by broadcasting their current options. We
  further propose the dynamic termination of options to addresses the flexibility-predictability dilemma.

GAME THEORY   *2016-*

- **Replication-robust Payoff Allocation in Machine Learning Data Markets** (Journal Paper Under Review,
  Paper Link) We present a theoretical analysis of the properties of classic cooperative game-theoretic solution
  concepts and their robustness against redundancy in submodular ML applications (common examples such as
  multiagent sensing, facility location, interpretable ML, data valuation, etc).
- **Behavioural Strategies in Weighted Boolean Games** (Journal of Information and Computation 2021,
  Paper Link) An agent aims to satisfy a weighted set of propositional logic goals by assigning truth values to its
  variables. However, an agent's goal may contain others' variables. We study the strategic interactions of agents
  in such games, developing efficient algorithms for finding equilibrium solutions.

NEURAL DYNAMICS   *2013*

- **Undergraduate Research Project** Modelled Retina-LGN-V1 visual network using Continuous Attractor Neural
  Networks (CANN), enabling neural inhibition, recurrent interactions; simulated behaviours of Microsaccade.

Internship and Experiences

Microsoft Research   *Cambridge, UK*
RESEARCH INTERN, SUPERVISED BY DR.SEBASTIAN TSCHIATSCHEK   *Jul - Oct 2019*
- Research project which studies robust game-theoretic payoff allocation in machine learning data markets.

Apple Siri   *Cambridge, UK*
MACHINE LEARNING INTERN, SUPERVISED BY DR.THOMAS VOICE   *Jul - Oct 2017*
- Developed an ML user simulator which interacts with dialogue systems in multi-turn dialogues.

Stowood Scientific Instruments Ltd   *Oxford, UK*
MICRO-INTERNSHIP: DEVELOPED ANDROID APP FOR SLEEP APNEA PATIENTS.   *Winter 2017*

Dept. Computer Science, University of Oxford   *Oxford, UK*
TA FOR COMPUTATIONAL GAME THEORY   *2016 - 2017*