# Matthew Sidji

# **EDUCATION**

## PhD Candidate in Human Computer Interaction

University of Melbourne - Current

- Recipient of the Ingenium Scholarship.
- Research explores the cognitive, social, and player experience impacts of introducing artificial agents to human teams in cooperative boardgames.

# **Bachelor of Science Advanced – Global Challenges (Mathematics)**

Monash University - Graduated 2020

• Major in Mathematics, minor in Physics and Philosophy.

#### RESEARCH

#### MeepleMate

University of Melbourne – March 2022 to Present Advisors: Dr Melissa Rogerson Contributions:

- The project uses novel prototypes to understand how boardgamers engage with each other at a distance.
- Developed Hi-Fi prototypes for a cultural probe study which involved the design and construction of electronic components.

#### **Prompt Eingeering ChatGPT for Codenames**

University of Melbourne, Flinders University – April 2024 to June 2024 Coauthor: Dr Matthew Stephenson Contributions:

- Drew upon state-of-the-art prompt engineering techniques to develop prompting strategies to test performance of the LLM ChatGPT.
- Tested and compared different prompting strategies for a LLM Codenames AI.

# Human-AI teaming in Codenames

University of Melbourne – September 2023 to February 2024 Advisor: A/Prof Wally Smith, Dr Melissa Rogerson Contributions:

- Explored how teams of human participants use an AI-powered language model as an assistant in playing Codenames and what impact this has on the game's dynamics and outcomes.
- Involved design of novel user interfaces for an AI assistant, collecting qualitative data through interviews and player observations.

# Hidden rules of Hanabi: How Humans Outperform AI Agents

University of Melbourne - February to September 2022

Advisor: A/Prof Wally Smith, Dr Melissa Rogerson

- Identified humans reasoning and communication practises within Hanabi. Outlined necessary areas of AI agent development affording agents better performance in Human-AI teams.
- Used Thematic Analysis to identify classes of behaviours humans use to communicate in the game Hanabi.

# Development of a Natural Language Drone Control System

STELaRLab, Lockheed Martin Australia – August 2020 to November 2020

Advisor: Dr Tony Lindsay, Dr Leon Clark, Dr Anee Azim, Anthony Silvestre

- Worked in a team of three to collaboratively research and produce a novel Natural Language Controlled Drone Flight Simulator.
- Utilised open-source software and employed novel and cutting-edge ASR engines, NLP models and drone flight simulators.
- Developed a program to interpret structured grammar outputted by a novel NLP model.
- Used Python, SQL and OpenStreetMap to identify spoken landmarks and produce desired coordinates.

# Adaption of an Optimal Path Planning Algorithm for Drones

Monash University - February 2020 to August 2020

- Adapted the 2D path-planning algorithm POLYANYA to account for objects with a set size.
- Worked with a large C++ codebase and employed optimisation techniques.

# PROFESSIONAL EXPERIENCE

#### **Academic Tutor**

University of Melbourne, Faculty of Engineering and IT – April 2022 to Current

- BSc Subject: Game Design School of Computing and Information Systems.
- MSc. Subject: Evaluating User Experience School of Computing and Information Systems.
- BSc Subject: Fundamentals of Interaction Design School of Computing and Information Systems (Head Tutor).
- MSc Subject: Impacts of Digitisation School of Computing and Information Systems.

# **Conference Organising Committee**

Digital Games Research Association Australia (DiGRAA)

- Reviewed academic papers for inclusion and publication at the conference.
- IT lead, managing the smooth delivery of the hybrid conference and online presenters.
- Chaired conference sessions.

# PUBLICATIONS

Matthew Sidji, Wally Smith, Melissa J. Rogerson. **"Human-AI Collaboration in Cooperative Games:** A Study of Playing Codenames with an LLM Assistant", Proceedings of the ACM on Human-Computer Interaction 8. CHI PLAY (2024).

Matthew Sidji, Matthew Stephenson, "**Prompt Engineering ChatGPT for Codenames**", IEEE Conference on Games (IEEE-COG'24), Milan, Italy, August 2024.

Matthew Sidji, Wally Smith, and Melissa J. Rogerson. **"The Hidden Rules of Hanabi: How Humans Outperform AI Agents"**. In: Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems. CHI '23. event-place: Hamburg, Germany. New York, NY, USA: Association for Computing Machinery, 2023. isbn: 978-1-45039421-5. doi: 10.1145/3544548.3581550. url: https://doi.org/10.1145/3544548.3581550.

# PRESENTATIONS

# ACM Conference on Human Factors in Computing Systems (CHI), Mutual Theory of Mind (MToM) Workshop, Hawaii

"Implications of Distributed Cognition to Mutual Theory of Mind" - April 2024

## Computing and Information Systems Doctoral Colloquium, University of Melbourne, Australia

"Exploring the Use of AI-Powered Tools in Cooperative Games: A Study of Human Participants Playing Codenames with a LLM assistant." – Oct 2023

#### ACM Conference on Human Factors in Computing Systems (CHI), Germany

"The Hidden Rules of Hanabi: How Humans Outperform AI Agents" - April 2023

#### CHIMelb, Melbourne Australia

"The Hidden Rules of Hanabi: How Humans Outperform AI Agents" - May 2023

#### OzCHI Doctoral Consortium, Canberra, Australia

"Human-AI interaction in cooperative games" - November 2022

Australian Defence Science, Technology and Research Summit (ADSTAR), Sydney, Australia "The Hidden Rules of Hanabi: How Humans Outperform AI agents" - July 2022

# TECHNICAL SKILLS

- Python
- C/C+
- Java

- Linux shell
- Arduino
- Matlab

- LATEX
- OpenStreetMap
- Prompt Engineering

# REFERENCES

Available upon request.