

Education

2019 – 2024 **PhD in Computer Science, Heriot-Watt University** 📍 *Edinburgh, UK*
Natural Language Processing and Robotics

Thesis: Learning to Handle Miscommunication in Multi-modal Conversational AI

The thesis focuses on miscommunications arising from **ambiguity in situated dialogues**, with industry partner **Siemens**. I have investigated vision and language models to identify and resolve ambiguous coreferences [4], along with the ability of distinct model architectures to **resolve coreferences** depending on the property used, such as colour or positions [3]. I also recently proposed a novel dataset collected via a crowdsourcing protocol [6], and benchmark to train and **evaluate VLLMs** on context-dependent ambiguities in simulated environments [2].

Relevant topics:

- Vision and language models for dialogue and instruction understanding.
- Repairing miscommunication and ambiguity in dialogues.
- Grounding language to objects in situated environments.
- Natural language and human-robot collaboration in real-world scenarios.

2014 – 2019 **MEng in Software Engineering, Heriot-Watt University** 📍 *Edinburgh, UK*
First-class degree with Distinction

Thesis: In collaboration with industry partner SeeByte, the thesis explored the behaviour of autonomous vehicles through an agent using natural language on-demand. The agent was able to explain why the vehicles were doing an action (or why not) and combined many areas such as dialogue, monitoring, and reasoning.

- Two peer-reviewed conference publications from thesis, several more from collaborations.
- Several prizes per year (including best thesis and top student).

Relevant courses: Conversational Agents and Dialogue Systems, Data Mining and Machine Learning, Robotics and Intelligent Agents, Interaction Design, Artificial Intelligence, Database Management Systems, High-performance and Parallel Computing, Industrial Programming.




Work Experience

2023 – 2023 **Applied Scientist Intern, Amazon Alexa AI** 📍 *Washington, DC, USA*
Worked in the Alexa AI SocialBot team, collaborating with in-person and remote colleagues. I researched the use of LLMs to understand user behaviour, which required loading, fine-tuning and evaluating large models on distinct tasks.


- Led to a peer-reviewed publication at an international venue [1].

2019 – 2019 **Research Assistant, Heriot-Watt University** 📍 *Edinburgh, UK*
Carried out a large-scale crowd-sourced data collection using a novel dialogue interface to interact with robots on an offshore platform. I led the development of the graphical interface, the simulated human-robot interaction, and the collection platform structure, publishing several peer-reviewed papers.

Work Experience (continued)

- 2018 – 2018** **Software Developer Intern, SeeByte Ltd**  *Edinburgh, UK*
- Working on a project to monitor underwater autonomous vehicles using augmented reality. I designed and coded a cross-platform program that connected to the vehicles and displayed them through a camera at their real-world GPS location. It required high-performance code for real-time image processing in C++ with OpenCV, Java and using ROS for communication.
- 2017 – 2017** **Research Assistant, Heriot-Watt University**  *Edinburgh, UK*
- Funded by the UK's Ministry of Defence (MoD) and collaborating with industry (SeeByte and Tekever), the project developed MIRIAM, a multimodal interface for autonomous systems. This interface enables operators to interrogate vehicles using speech or text about their actions or status.
- I led the work on the system's conversational capabilities: natural language processing (parsing, intent recognition and speech recognition), generation (responses, text-to-speech) and dialogue management.
- Resulted in multiple peer-reviewed publications and collaborations.
 - Carried out human studies with vehicles in real-world environments.
 - Delivered presentations and system demos to the MoD and other stakeholders.
- 2017 – 2024** **Various Teacher Assistant Roles, Heriot-Watt University**  *Edinburgh, UK*
- Mentored students and graded university coursework and exams for several graduate and undergraduate courses: Artificial Intelligence and Intelligent Agents (Year 3/MSc), Conversational Agents and Dialogue Systems (Year 4/Msc), Language Processors (Year 3) and Software Development 1 & 2 (Year 1).

Other Highlights

- 2022-2023**  Co-organiser of YRRSDS 2022 and 2023 Workshops.
- 2023**  **Best Short Paper** Award at SIGDIAL'23.
- 2022**  Computer Science **PhD Representative** for the university department.
- 2021**  Interviewed for the **Robot Talk Podcast** on Human-Robot Collaboration.
- 2019**  The British Computer Society Prize, from the British Computer Society and Heriot-Watt University.
-  Invited to the **Schloss Dagstuhl** GI Seminar on Explainable Software for Cyber-Physical Systems.
- 2018**  Finalist for the Young Software Engineer of the Year Award 2018, from ScotlandIS.
-  The Cooper-Walker Engineering Ltd 2017/2018 Prize, from Heriot-Watt University.

Skills

- Machine Learning** ➤ Daily use of libraries: PyTorch, PyTorch Lightning, Weight and Biases, TensorFlow.
- NLP Resources** ➤ Wide knowledge of HuggingFace, pre-trained models, transformers, SpaCy, NLTK...
- Programming** ➤ Strong proficiency with Python, C++, Java, JavaScript, PHP and others (C, C#, SML).
- Coding Tools** ➤ Strong knowledge of Git, GitHub, CMake, OpenCV, Anaconda, Unity, React, SQL...
- Robotics** ➤ Familiar with ROS, Gazebo simulator, PDDL, YARP, sensor communications...
- Languages** ➤ Academic-level reading, writing and speaking competencies in English and Spanish.
- Research** ➤ Strong skills in user studies and human-agent interaction through natural language.

Notable Research Publications

Full list of publications and more information available at <https://jchiyah.github.io/publications>

- 1 **Chiyah-Garcia, Javier**, Prasoon Goyal, Michael Johnston, and Reza Ghanadan (2024). *Adapting LLM Predictions in In-Context Learning with Data Priors*. In: CustomNLP4U at EMNLP'24.
- 2 **Chiyah-Garcia, Javier**, Alessandro Suglia, and Arash Eshghi (2024). *Repairs in a Block World: A New Benchmark for Handling User Corrections with Multi-Modal Language Models*. In: EMNLP'24.
- 3 **Chiyah-Garcia, Javier**, Alessandro Suglia, Arash Eshghi, and Helen Hastie (2023). *'What are you referring to?' Evaluating the Ability of Multi-Modal Dialogue Models to Process Clarificational Exchanges*. In: SIGDIAL'23.
🏆 **Best Short Paper Award**.
- 4 **Chiyah-Garcia, Javier**, Alessandro Suglia, José David Lopes, Arash Eshghi, and Helen Hastie (2022). *Exploring Multi-Modal Representations for Ambiguity Detection & Coreference Resolution in the SIMMC 2.0 Challenge*. In: *DSTC10 Workshop at AAAI 2022*.
- 5 **Chiyah Garcia, Francisco J.**, Simón C. Smith, José Lopes, Subramanian Ramamoorthy, and Helen Hastie (2021). *Self-Explainable Robots in Remote Environments*. In: HRI '21 Companion.
- 6 **Chiyah Garcia, Francisco J.**, José Lopes, Xingkun Liu, and Helen Hastie (2020). *CRWIZ: A Framework for Crowdsourcing Real-Time Wizard-of-Oz Dialogues*. In: LREC '20.
- 7 Lopes, José, **Francisco J. Chiyah Garcia**, and Helen Hastie (2020). *The Lab vs The Crowd: An Investigation into Data Quality for Neural Dialogue Models*. In: *Workshop on Human in the Loop Dialogue Systems at NeurIPS 2020*.
- 8 Blumreiter, Mathias, Joel Greenyer, **Francisco Javier Chiyah Garcia**, Verena Klös, Maike Schwammberger, Christoph Sommer, Andreas Vogelsang, and Andreas Wortmann (2019). *Towards Self-Explainable Cyber-Physical Systems*. In: MODELS-C '19.
- 9 **Chiyah Garcia, Francisco J.**, David A. Robb, Atanas Laskov, Xingkun Liu, Pedro Patron, and Helen Hastie (2018). *Explainable Autonomy: A Study of Explanation Styles for Building Clear Mental Models*. In: INLG'18.
- 10 **Chiyah Garcia, Francisco J.**, David A. Robb, Xingkun Liu, Atanas Laskov, Patron Patron, and Helen Hastie (2018). *Explain Yourself: A Natural Language Interface for Scrutable Autonomous Robots*. In: HRI'18.
- 11 Hastie, Helen, **Francisco J. Chiyah Garcia**, David A. Robb, Pedro Patron, and Atanas Laskov (2018). *MIRIAM: A Multimodal Interface for Explaining the Reasoning Behind Actions of Remote Autonomous Systems*. In: ICMI'18.

Main editor of the following proceedings:

- 12 *Proceedings of the 19th Annual Meeting of the Young Researchers' Roundtable on Spoken Dialogue Systems* (2023). YRRSDS'23 Workshop.