

Cesar A. Contreras

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RESEARCH PROFILE

Robotics researcher and PhD candidate at the University of Birmingham, developing human-centred variable-autonomy methods for mobile manipulation. My research combines probabilistic intent inference, inspectable language-model planning, perception and XR-enabled teleoperation, with applications in nuclear decommissioning and electric-vehicle battery disassembly.

Google Scholar snapshot, 18 October 2026: 138 citations; h-index 7; i10-index 7.

RESEARCH AGENDA

My long-term aim is to establish an independent research programme in human-centred, variable-autonomy robotics for demanding operational environments. I am interested in research-focused university positions and collaborations in Texas, particularly the San Antonio area.

- Intent across base and arm: infer changing navigation and manipulation goals without requiring a fixed goal list.
- Inspectable robot planning: connect operator language to grounded plans whose intermediate decisions can be reviewed and corrected.
- Human-centred evaluation: distinguish prediction accuracy, interface usability and physical task outcomes when assessing assistance.

EDUCATION

University of Birmingham | Birmingham, UK

PhD candidate in Robotics

Sep 2023 - 2027 (expected)

- Research: variable autonomy control applied to mobile manipulation; robotics, human-robot interaction, artificial intelligence and XR.
- Planned thesis submission: 21 March 2027; planned viva: 21 May 2027. Degree conferral is subject to the examination outcome, any corrections and university approval.

University of Birmingham | Birmingham, UK

MSc Computational Neuroscience and Cognitive Robotics - Distinction

Sep 2022 - Sep 2023

- Thesis: Falling Ball - Gravity perception and eye tracking during object interception in VR.

Anahuac University North Campus | Huixquilucan, Mexico

BSc Mechatronics Engineering

Aug 2016 - Dec 2020

- Dissertation: Robot Operating System for Industry 4.0. Minors in Industrial Automation, Automotive Mechanics Design and Entrepreneurial Studies.

RESEARCH EXPERIENCE

Extreme Robotics Lab, University of Birmingham | Birmingham, UK

Robotics Researcher

Feb 2023 - Present

- Variable autonomy for mobile manipulation, following initial VR, mixed-reality and cognitive-robotics work in February-August 2023.
- First author of Probabilistic Human Intent Prediction for Mobile Manipulation (JIRS, 2026) and the variable-autonomy mini-review (2025); co-authored research includes LLM planning, XR teleoperation and EV-battery disassembly.
- Fukushima placements, Naraha, Japan: decommissioning bogie collaboration (May-July 2024); stair-climbing robot 3D mapping with agentic LLMs (November 2025-January 2026).

PAPERS

- Marta Pedretti; **Cesar Alan Contreras**; Rustam Stolkin; Alireza Rastegarpanah; Roberto Pagani. Interactive and Inspectable LLM Planning for Human-in-the-Loop EV Battery Disassembly. *Frontiers in Robotics and AI* 13, 1916454 (2026). [\[Paper\]](#)
- Nicholas Kenny; **Cesar Alan Contreras**; Basile Ouedraogo; Rustam Stolkin; Manolis Chiou; Maria Kyrarini. GUIDER: Evaluating Goal-Free Human Intent Inference for Teleoperated Manipulation on Real-Robot Data. preprint arXiv:2608.15446. (2026). [\[Paper\]](#)
- **Cesar Contreras**, documented panel participant; section has no individual author byline. Panel session: Safety considerations for automated and AI technologies. *The Role of Innovation in the Nuclear Back-End: Harnessing Robotics and Advanced Technologies for Safer, More Efficient Activities*, pp. 85-91. OECD Publishing, Nuclear Energy Agency. (2026). [\[Paper\]](#)
- **Cesar Contreras**, documented presenter; section has no individual author byline. Introducing autonomous robotic technologies to safety-critical industries. *The Role of Innovation in the Nuclear Back-End: Harnessing Robotics and Advanced Technologies for Safer, More Efficient Activities*, pp. 79-81. OECD Publishing, Nuclear Energy Agency. (2026). [\[Paper\]](#)
- Cansu Erdogan; **Cesar Alan Contreras**; Alireza Rastegarpanah; Manolis Chiou; Rustam Stolkin. Intent-driven LLM ensemble planning for flexible multi-robot manipulation. *Frontiers in Robotics and AI* 13, 1727433 (2026). [\[Paper\]](#)
- **Cesar Alan Contreras**; Manolis Chiou; Alireza Rastegarpanah; Michal Szulik; Rustam Stolkin. Probabilistic human intent prediction for mobile manipulation: An evaluation with human-inspired constraints. *Journal of Intelligent & Robotic Systems* 112(2), 36 (2026). [\[Paper\]](#)
- Alireza Rastegarpanah; Carmelo Mineo; **Cesar Alan Contreras**; Abdelaziz Shaarawy; Giovanni Paragliola; Rustam Stolkin. Haptic Teleoperation in Extended Reality for Electric Vehicle Battery Disassembly Using Gaussian Mixture Regression. *Journal of Field Robotics* 43(2): 1130-1151 (2026). [\[Paper\]](#)
- Junyeon Kim; Tianshu Ruan; **Cesar Alan Contreras**; Manolis Chiou. An Exploratory Study on Crack Detection in Concrete through Human-Robot Collaboration. preprint arXiv:2508.11404. (2025). [\[Paper\]](#)
- **Cesar Alan Contreras**; Manolis Chiou; Alireza Rastegarpanah; Michal Szulik; Rustam Stolkin. Utilizing Vision-Language Models as Action Models for Intent Recognition and Assistance. preprint arXiv:2508.11093. (2025). [\[Paper\]](#)
- **Cesar Alan Contreras**; Alireza Rastegarpanah; Manolis Chiou; Rustam Stolkin. A mini-review on mobile manipulators with Variable Autonomy. *Frontiers in Robotics and AI* 12 (2025): 1540476. [\[Paper\]](#)
- Alireza Rastegarpanah; **Cesar Alan Contreras**; Mohamed Ahmeid; Mohammed Eesa Asif; Enrico Villagrossi; Rustam Stolkin. Advanced robotics for automated EV battery testing using electrochemical impedance spectroscopy. *Frontiers in Robotics and AI* 11 (2025): 1493869. [\[Paper\]](#)
- Jamie Hathaway; **Cesar Alan Contreras**; Mohammed Eesa Asif; Rustam Stolkin; Alireza Rastegarpanah. Technoeconomic Assessment of Electric Vehicle Battery Disassembly - Challenges and Opportunities from a Robotics Perspective. *IEEE Access* 13: 716-733 (2025). [\[Paper\]](#)
- Alireza Rastegarpanah; **Cesar Alan Contreras**; Rustam Stolkin. Semi-Autonomous Robotic Disassembly Enhanced by Mixed Reality. *Proceedings of the 2024 4th International Conference on Robotics and Control Engineering*, pp. 7-13. (2024). [\[Paper\]](#)
- Cansu Erdogan; **Cesar Contreras**; Rustam Stolkin; Alireza Rastegarpanah. Multi-robot task planning for efficient battery disassembly in electric vehicles. *Robotics* 13(5), 75 (2024). [\[Paper\]](#)
- Alireza Rastegarpanah; Carmelo Mineo; **Cesar Alan Contreras**; Ali Aflakian; Giovanni Paragliola; Rustam Stolkin. Electric Vehicle Battery Disassembly using Interfacing Toolbox for Robotic Arms. *Batteries* 10(5), 147 (2024). [\[Paper\]](#)
- Alireza Rastegarpanah; **Cesar Alan Contreras**; Rustam Stolkin. Hyperparameter-optimized CNN and CNN-LSTM for Predicting the Remaining Useful Life of Lithium-ion Batteries. *2023 Eleventh International Conference on Intelligent Computing and Information Systems (ICICIS)*, pp. 110-115. IEEE. (2023). [\[Paper\]](#)
- Alireza Rastegarpanah; **Cesar Alan Contreras**; Rustam Stolkin. Harnessing CNN-DNC and CNN-LSTM-DNC Architectures for Enhanced Lithium-Ion Remaining Useful Life Prediction. *2023 Eleventh International Conference on Intelligent Computing and Information Systems (ICICIS)*, pp. 116-121. IEEE. (2023). [\[Paper\]](#)
- **Cesar Alan Contreras**; Alireza Rastegarpanah; Rustam Stolkin. Teleoperation of a Robotic Arm Using Eye Tracking in a Mixed Reality Environment. Working paper, Zenodo, 10.5281/zenodo.21879565. (2023). [\[Paper\]](#)
- **Cesar Alan Contreras**; Sang-Hoon Yeo (repository creator listing). Falling Ball - Gravity perception and eye tracking during object interception in VR. MSc thesis, University of Birmingham, Zenodo, 10.5281/zenodo.21890465. (2023). [\[Paper\]](#)
- **Cesar Alan Contreras**; Runlong Yang; Yang Liu; Yongle Huang; Zongyuan Zhang. ROBOCART: A self-navigating shopping cart for the supermarket. Preprint, Zenodo, concept DOI 10.5281/zenodo.21889524. (2023). [\[Paper\]](#)

TALKS AND PRESENTATIONS

- [COSIMO-IDAI Generative AI Series: LLM orchestration and practical generative AI workflows](#). Talk and discussion, Elm House, University of Birmingham, 27 February 2026.
- [Master Class on LLMs for Entertainment and Business](#). Co-delivered five-day programme of lectures, labs and round-table discussions, Bucharest, Romania, 29 October - 2 November 2025.
- [Probabilistic Human Intent Recognition for Mobile Manipulators](#). UKNNL KM Talks, hybrid presentation, United Kingdom, 25 September 2025.
- [Workshop on the Role of Innovation in the Nuclear Back-End](#). Presentation and panel contribution on robotics and advanced technologies, Workington, Cumbria, 31 March - 4 April 2025; written proceedings contributions published in July 2026.

TEACHING EXPERIENCE AND STUDENT CO-SUPERVISION

Co-supervised approximately seven students across undergraduate and master's levels.

Additional teaching: basic robot algorithms classes for a robotics team; microcontrollers laboratory teaching during bachelor's studies; biweekly practical courses for students and professors on LLM workflows and AI coding harnesses, including Codex, Antigravity and Claude Code.

University of Birmingham, School of Mathematics | Birmingham, UK

Teaching Assistant

Jul 2026 - Sep 2026

- Jinan University-University of Birmingham Joint Institute (J-BJI).

Master Class on LLMs for Entertainment and Business | Bucharest, Romania

Co-delivered five-day master class

29 Oct - 2 Nov 2025

- Lectures, practical labs and round-table discussions on LLM workflows, document querying and human review.

RESEARCH FUNDING AND IN-KIND SUPPORT

NDA studentship (2023-2027), funded by the Nuclear Decommissioning Authority and supported by the United Kingdom National Nuclear Laboratory (UKNNL), for variable autonomy in mobile manipulation.

REBELION project support: automated lithium-ion battery repurposing and recycling. UKRI Grant 10079049 is acknowledged in the GUIDER journal paper; the wider EU consortium identifies Grant 101104241. These are project support references, not personal PI awards.

Grant of access to OpenAI models through the ChatGPT for Academic Researchers program (in-kind model access).

Additional RTX computers funded by GalacNo Ltd.

PEER-REVIEW SERVICE

- IEEE Access: 47 manuscripts during 2024-2026.
- IEEE ICRA: 2 manuscripts in 2025.
- Computers & Electrical Engineering: 2 manuscripts in 2024.

EARLIER EXPERIENCE

Sensorimotor Computation Lab (Yeo Lab) | Birmingham, UK

Graduate Research Assistant

Oct 2022 - Sep 2023

- Designed and conducted simulated eye-tracking and movement experiments; analysed human biomechanics and movement prediction.
- Cleaned experimental data and developed statistical models and visualisations. Calibrated sensors and built device bridges for XR experiments and physics simulations.

Grupo Importadores | Piedras Negras, Mexico

Software Engineer

Mar 2021 - Feb 2023

- Developed software, supported a website launch and maintained computers and servers.

Dreamlands' Guild | Texas, USA

Software Engineer

Feb 2021 - Sep 2022

- Built Flutter applications and Unity games with C#; used Python to connect software and hardware systems.

Laboratory of Automation and Manufacturing, Anahuac | Huixquilucan, Mexico

Junior Robotics Engineer

Jun 2020 - Dec 2020

- Worked in a four-person team integrating ROS with laboratory equipment.
- Conducted more than 50 robot simulations using CIROS Studio, Gazebo, CoppeliaSim, MoveIt and MATLAB, including integration with ROS.

CADIT, Anahuac University | Huixquilucan, Mexico

Technology and Innovation Engineer

Aug 2019 - Dec 2020

- Investigated DICOM-based 3D printing of jaws and teeth in three materials; simulated prosthesis designs.
- Adapted 3D-printing hardware for in-house materials, reducing equipment costs by more than 30%. Prototyped human-machine interface equipment and led a three-person rapid-prototyping team.

Laboratory of Automation and Manufacturing, Anahuac | Huixquilucan, Mexico

Mechatronics Student Club Captain

Jan 2019 - Dec 2020

- Led a six-person team on time-based engineering projects; designed CAD models and electronic schematics, programmed embedded systems and evaluated prototypes.

SKILLS AND INTERESTS

Programming: Python, C#, MATLAB, C, C++, Assembly; PLC programming (LD, FBD, ST, IL).

Robotics and ML: ROS 1/2, Gazebo, Isaac Sim, MoveIt, CoppeliaSim, NumPy, SciPy, Pandas, Scikit-learn, PyTorch; UR, KUKA and Mitsubishi robot arms.

Frameworks and SDKs: Flutter, OpenCV, UltraLeap, FOVE, OpenXR, OpenGL, Vuforia, POLHEMUS Fastrak.

Software and tools: Unity, CIROS Studio, Factory I/O, FluidSIM, Proteus, Creo, SolidWorks, Simulink, Mastercam, Multisim, Polyscope, Siemens LOGO!, Microsoft Office, PyCharm, Spyder, VS Code, Git, Docker; Windows and Linux.

Languages: English and Spanish (native/bilingual); French (basic). Interests include robotics, assistive AI, adaptive XR, simulation, computer vision and smart environments.

SELECTED CERTIFICATIONS

- Unity Junior Programmer; Unity Creative Core; Deep Reinforcement Learning (Hugging Face).
- Robotics: Aerial Robotics; Robotics: Perception (University of Pennsylvania).

AWARDS AND ADDITIONAL SERVICE

125th Anniversary Travel Fund recipient; NDA PhD Student Bursary; Anahuac University Academic Excellence (2020).

INGENIA co-founder, Anahuac University; ASUA community volunteer; Interact Club treasurer, Rotary District 4110, Piedras Negras, Mexico.