

Christian Cabrera-Jojoa

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I am a senior research associate and affiliated lecturer at the Department of Computer Science and Technology of the University of Cambridge and an Academic Associate at Pembroke College. I received a PhD degree in Computer Science from Trinity College Dublin in 2020. My current research addresses the problems and challenges of deploying Artificial Intelligence systems in the real world. I am investigating the intersection between systems engineering, software engineering and AI to develop novel approaches for designing and building safe and interpretable autonomous systems.

Education

- June 2020 **Ph.D. in Computer Science**, Trinity College Dublin, Dublin, Ireland
Dissertation: [uDiscovery: An Urban-Centric Model for Service Discovery in Smart Cities](#).
Supervisor: Prof. Siobhán Clarke
Research focus on the IoT service discovery and composition problems in large, dynamic, and distributed networks.
- September 2014 **M.Sc. in Systems and Computer Engineering**, Los Andes University, Bogotá, Colombia
Master's Dissertation: [MOWL: A Domain Specific Language for Handling Modular Ontologies](#).
Research focus on knowledge management to integrate multiple knowledge models.
GPA: 4.37/5.0
- September 2011 **B.Sc. in Systems Engineering**, Universidad de Nariño, Pasto, Colombia
GPA: 4.06/5.0

Experience

- December 2024 **Senior Research Associate**, Department of Computer Science and Technology, University of Cambridge, United Kingdom
- Current Current research on self-sustaining software systems (S4) and the problem of deploying AI-based systems in the real world. Particularly, I am exploring systems engineering principles and autonomic computing approaches to enable the design and monitoring of interpretable AI-based systems.
- October 2024 **Affiliated Lecturer**, Department of Computer Science and Technology, University of Cambridge, United Kingdom
- Current *Advanced Data Science*, Bachelors course: Course director and lecturer responsible for designing the course syllabus, material, and students projects around the challenges data scientists face in reality. Supporting students' progress in laboratory sessions.
- November 2024 **Academic Associate**, Pembroke College, University of Cambridge, United Kingdom
- Current Supervision activities of undergraduate students in different areas, such as Artificial Intelligence, Programming, Concurrent and Distributed Systems, and Databases.
- March 2021 **Research Associate**, Department of Computer Science and Technology, University of Cambridge, United Kingdom
- November 2024 Current research on self-sustaining software systems (S4) and the problem of deploying AI-based systems in the real world as part of [the AutoAI project](#). Particularly, I am exploring systems engineering principles and autonomic computing approaches to enable the design and monitoring of AI-based systems. The ultimate goal of this research is to ensure AI-based systems perform robustly, safely, accurately, and autonomously in their deployed environment.

October 2021 October 2024	Teaching Assistant , Department of Computer Science and Technology, University of Cambridge, United Kingdom <i>Advanced Data Science</i> , Bachelors course: Course director and lecturer responsible for designing the course syllabus, material, and students projects around the challenges data scientists face in reality. Supporting students' progress in laboratory sessions.
October 2023 Current	Teaching Assistant/Supervisor , Department of Computer Science and Technology, University of Cambridge, United Kingdom <i>Advanced Data Science, Artificial Intelligence, Concurrent and Distributed Systems, Databases, and Concepts in Programming Languages</i> , Bachelors courses: Teaching sessions through the term.
May 2019 February 2021	Research Assistant (May 2019 - Jun 2020) - Research Fellow (Jun 2020 - Feb 2021) , School of Computer Science and Statistics, Trinity College Dublin, Ireland Research on the provision of context-aware, pervasive and resilient applications in large and dynamic urban environments. Particularly, exploring the <i>self-adaptive organisation of services information</i> based on RL algorithms in smart cities, and the dynamic and proactive <i>service placement problem</i> at the edge based on meta-heuristic and prediction models.
March 2015 February 2021	Teaching Assistant , School of Computer Science and Statistics, Trinity College Dublin, Ireland <i>Advanced Software Engineering</i> , Master's course, <i>What is the Internet doing to me?</i> , TCD elective course, <i>Scalable Computing</i> , Master's course, <i>Systems Programming I</i> , 2nd year Bachelors course, and <i>Programming Project</i> , 1st year Bachelors course.
August 2014 December 2014	Software Project Lead , Conecta-TE, Los Andes University, Bogotá, Colombia Work on analysis, design and development of software to support educational processes.
February 2012 July 2014	Research Graduate Assistant , Systems Engineering Department, Los Andes University, Bogotá, Colombia Research on the semantic web, learning objects, and mobile learning. Master's thesis. Design and implementation of a domain-specific language to handle modular ontologies.
February 2011 December 2011	Software Developer , CJT&T Software Engineering, Pasto, Colombia Work on analysis, design and development of software.

Awards, and Scholarships

Awards

November 2018	Ph.D. Final Year Trinity Employability Award , in partnership with Intel. Dublin, Ireland
November 2011	Best B.Sc. Research Final Project , Universidad de Nariño, Pasto, Colombia

Scholarships

March 2015	Ph.D. research studentship in Dynamic Service Adaptation , Science Foundation Ireland, Dublin, Ireland
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Supervision

PhD Students

October 2025 Current	Harry Allen , UKRI AI Centre for Doctoral Training in Decision Making for Complex Systems, University of Cambridge, UK, Co-supervisor: Neil Lawrence Project topic: <i>Interpretable Self-Sustaining Systems</i> .
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Undergrad Students

2024-2025	Joseph Poon , University of Cambridge, UK Project topic: <i>Adapting Service Placement Algorithms for Edge Computing: Implementing a Decentralized Approach in iFogSim</i> .
2024-2025	Arvind Raghu , University of Cambridge, UK Project topic: <i>CDN Simulator for Benchmarking Self-Adaptive System Approaches</i> .

Service to the Scientific Community

Roles in Academic Journals

- Current **Reviewer for international peer-reviewed journals**, *IEEE Transactions on Services Computing (TSC)*, and *IEEE Internet of Things Journal*
- 2025 **Co-organiser**, *The Third UK AI Conference 2025*, UK-AI community
- 2025 **Co-organiser**, *The 7th Workshop on Data, Learning and Inference 2025*, DALI Sorrento 2025
- 2025 **Web Chair**, *20th International Conference on Software Engineering for Adaptive and Self-Managing Systems*, SEAMS 2025
- 2024 **Co-organiser**, *The Second UK AI Conference 2024*, UK-AI community
- 2023 **Co-organiser**, *The First UK AI Conference 2023 - Turing AI Fellowship Event*, UK-AI community
- 2023 **Co-organiser**, *Turing AI Fellows and Teams Hackathon*, UK-AI community
- 2022 - 2024 **Co-organiser**, *NeurIPS at Cambridge Meetup*, NeurIPS Satellite Event
- 2022 **Co-organiser**, *Challenges in Deploying and Monitoring ML Systems*, NeurIPS Virtual Workshop
- 2022 **Co-organiser**, *ATI AI Fellows day at Cambridge*, UK-AI community

Publications

Peer-Reviewed Journals

- J6 **Cabrera C.**, Paleyes A., Lawrence N., *Real-world Machine Learning Systems: A survey from a Data-Oriented Architecture Perspective*. *ACM Computing Surveys (CSUR)*, Under Review.
- J5 **Cabrera C.**, Svorobej S., Palade A., Kazmi A., Clarke S., *MAACO: A Dynamic Service Placement Model for Smart Cities*. *IEEE Transactions on Services Computing (TSC)*, IEEE, 2023.
- J4 **Cabrera C.**, Clarke S., *A self-adaptive service discovery model for smart cities*. *IEEE Transactions on Services Computing (TSC)*, Vol. 15, No. 1, pp. 386-399, IEEE 2022.
- J3 Tabatabaee H., Rasool S., Kazmi A., Palade A., **Cabrera C.**, White G., Clarke S., *Dynamic Service Placement in Multi-access Edge Computing: a Systematic Literature Review*. *IEEE Access*, Vol. 10, pp. 32639-32688, IEEE 2022.
- J2 Rojas E., Bastidas V., **Cabrera C.**, *Cities-Board: A Framework to Automate the Development of Smart Cities Dashboards*. *IEEE Internet of Things Journal*, Vol. 7, pp. 10128-10136, IEEE 2020.
- J1 Palade A., **Cabrera C.**, Li F., White G., Razzaque MA., Clarke S., *Middleware for internet of things: an evaluation in a small-scale IoT environment*. *Journal of Reliable Intelligent Environments*, Vol. 4, pp. 3-23, SpringerLink 2018.

Peer-Reviewed Conference Proceedings

- C21 **Cabrera C.**, Bastidas V., Schooling J, Lawrence ND., *The Systems Engineering Approach in Times of Large Language Models*. *Proceedings of the 58th Hawaii International Conference on System Sciences.*, 2025.
- C20 Robinson D., **Cabrera C.**, Gordon AD., Lawrence ND., Mennen L., *Requirements are All You Need: The Final Frontier for End-User Software Engineering*. *ACM Transactions on Software Engineering and Methodology (TOSEM)*, 2025.
- C19 **Cabrera C.**, Paleyes A., Lawrence ND., *Self-sustaining Software Systems (S4): Towards Improved Interpretability and Adaptation*. *Proceedings of the International Workshop New Trends in Software Architecture (SATrends 24)*, 2024.
- C18 Kazmi A., Staffolani A., Zhang T., **Cabrera C.**, Clarke S., *Dynamic Service Placement in Edge Computing: A Comparative Evaluation of Nature-Inspired Algorithms*. *IEEE Access*, 2024.
- C17 Cardozo N., Dusparic I., **Cabrera C.**, *Prevalence of Code Smells in Reinforcement Learning Projects*. *Proceedings of the 2nd International Conference on AI Engineering: Software Engineering for AI*, 2023.
- C16 Paleyes A., **Cabrera C.**, Lawrence ND., *An Empirical Evaluation of Flow Based Programming in the Machine Learning Deployment Context*. *Proceedings of the 1st International Conference on AI Engineering: Software Engineering for AI*, 2022.

- C15 Paleyes A., **Cabrera C.**, Lawrence ND., [Towards Better Data Discovery and Collection with Flow-Based Programming](#). *Neurips Data-Centric AI Workshop (DCAI)*, 2021.
- C14 **Cabrera C.**, Clarke S., [A Reinforcement Learning-Based Service Model for the Internet of Things](#). *International Conference on Service-Oriented Computing (ICSOC)*, pp. 790-799, SpringerLink 2021.
- C13 Palade A., Mukhopadhyay A., Kazmi A., **Cabrera C.**, Nomayo E., Iosifidis G., Ruffini M., Clarke S., [A Swarm-based Approach for Function Placement in Federated Edges](#). *IEEE International Conference on Services Computing (SCC)*, IEEE 2020.
- C12 **Cabrera C.**, Palade A., White G., Clarke S., [An Urban-driven Service Request Management Model](#). *IEEE International Conference on Pervasive Computing and Communications (PerCom 2020)*.
- C11 Li F., **Cabrera C.**, Clarke S., [A WS-Agreement Based SLA Ontology for IoT Services](#). *International Conference on Internet of Things*, pp. 58-72, SpringerLink 2019.
- C10 White G., Palade A., **Cabrera C.**, Clarke S., [Autoencoders for QoS Prediction at the Edge](#). *IEEE International Conference on Pervasive Computing and Communications (PerCom 2019)*.
- C9 **Cabrera C.**, Palade A., White G., Clarke S., [Services in IoT: A Service Planning Model based on Consumer Feedback](#). *International Conference on Service-Oriented Computing (ICSOC)*, pp. 304-313, SpringerLink 2018.
- C8 Palade A., **Cabrera C.**, White G., Clarke S., [Stigmergic Service Composition and Adaptation in Mobile Environments](#). *International Conference on Service-Oriented Computing (ICSOC)*, pp. 618-633 SpringerLink 2018.
- C7 White G., **Cabrera C.**, Palade A., Clarke S., [Augmented Reality in IoT](#). *Workshop on Context-Aware and IoT Services (CloTS) in the International Conference on Service-Oriented Computing (ICSOC)*, pp. 149-160, SpringerLink 2018.
- C6 **Cabrera C.**, Palade A., White G., Clarke S., [The Right Service at the Right Place: A Service Model for Smart Cities](#). *IEEE International Conference on Pervasive Computing and Communications (PerCom 2018)*.
- C5 White G., Palade A., **Cabrera C.**, Clarke S., [IoTpredict: Collaborative QoS Prediction in IoT](#). *IEEE International Conference on Pervasive Computing and Communications (PerCom)*, IEEE 2018.
- C4 White G., Palade A., **Cabrera C.**, Clarke S., [Quantitative Evaluation of QoS Prediction in IoT](#). *47th Annual IEEE/IFIP International Conference on Dependable Systems and Networks Workshops (DSN-W 2017)*, IEEE 2017.
- C3 **Cabrera C.**, Li F., Nallur V., Palade A., White G., Razzaque MA., Clarke S., [Implementing heterogeneous, autonomous, and resilient services in IoT: an experience report](#). *IEEE 18th International Symposium on A World of Wireless, Mobile and Multimedia Networks (WoWMoM)*, IEEE 2017.
- C2 Palade A., **Cabrera C.**, White G., Razzaque MA., Clarke S., [Middleware for Internet of Things: A quantitative evaluation in small scale](#). *IEEE 18th International Symposium on A World of Wireless, Mobile and Multimedia Networks (WoWMoM)*, IEEE 2017.
- C1 **Cabrera C.**, Palade A., Clarke S., [An evaluation of service discovery protocols in the internet of things](#). *17th Proceedings of the Symposium on Applied Computing (SAC)*, pp. 469-476, ACM 2017.

References

Current supervisor **Prof. Neil D. Lawrence**, *DeepMind Professor of Machine Learning at University of Cambridge*, Department of Computer Science and Technology, University of Cambridge, William Gates Building, 15 JJ Thomson Avenue, Cambridge
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Current supervisor **Dr. Carl Henrik Ek**, *Associate Professor at University of Cambridge*, Department of Computer Science and Technology, University of Cambridge, William Gates Building, 15 JJ Thomson Avenue, Cambridge
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Ph.D. Thesis supervisor **Prof. Siobhán Clarke**, *Professor at Trinity College Dublin*, School of Computer Science and Statistics, College Green, Dublin 2, Ireland
Email: Siobhan.Clarke@scss.tcd.ie