

Carles Balsells Rodas

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Research interests: Representation learning, Deep learning, Sequential data, Causality, Generative Models.

Education

- 2021 – Present **Ph.D. in Computing, Imperial College London**
Thesis title (preliminary): *Sequential representation learning*.
Supervisor: Dr. Yingzhen Li
- 2019 – 2021 **M.Sc. Machine Learning, KTH Royal Institute of Technology**
Thesis title: *Causal discovery in video data*.
GPA: 4.0/4.0
- 2015 – 2019 **B.Sc. Informatics Engineering, Universitat Politècnica de Catalunya**
- 2014 – 2019 **B.Sc. Engineering Physics, Universitat Politècnica de Catalunya**

Research Experience

- Oct 2023 – Feb 2024 **Applied Science Intern. Amazon Berlin.**
 - > *Explainable Uncertainty Attribution for Sequential Recommendation*.
Accepted at ACM SIGIR 2024 Short Paper Track.
- Oct 2019 – Sep 2021 **Research Engineer. KTH Royal Institute of Technology.**
Robotics Perception and Learning (RPL). Supervised by Prof. Hedvig Kjellström.
 - > *Causal discovery in video data* (Mar 2020 - Aug 2021).
 - > *Synthetic data for human social interaction using PGMs* (Oct 2019 - Mar 2020).
- Feb 2019 – Jul 2019 **Visiting Student (Research Award Recipient). University of Toronto.**
Department of Computer Science. Supervised by Prof. Sven Dickinson.
 - > *Joint object boundary and skeleton detection using convolutional neural networks*.

Publications

- Balsells-Rodas, C., Wang, Y., & Li, Y. (2023).** On the identifiability of markov switching models. In *Icml 2023 workshop on structured probabilistic inference & generative modeling*. Retrieved from <https://openreview.net/forum?id=lnPoe39GEs>
- Balsells Rodas, C., Tu, R., Li, Y., & Kjellstrom, H. (2022).** Causal discovery from conditionally stationary time series. Retrieved from https://openreview.net/forum?id=LIAN4ILH_68
- Zhu, H., Balsells Rodas, C., & Li, Y. (2022).** Markovian gaussian process variational autoencoders. *arXiv preprint arXiv:2207.05543*. Retrieved from <https://arxiv.org/abs/2207.05543>
- Balsells Rodas, C., Canal Anton, O., & Taschin, F. (2021).** [re] hamiltonian generative networks. *ReScience C*, 7(2), #18. [doi:10.5281/zenodo.4835278](https://doi.org/10.5281/zenodo.4835278)

Talks and presentations

- 2023 **Talk: On the identifiability of Switching Dynamical Systems**
Amazon Berlin Forecast Science Meeting, Valencia, Spain, Mar 6th 2024.
- Talk: On the identifiability of Switching Dynamical Systems**
Amazon Berlin Forecast Science Meeting (online), Nov 28th 2023.
- Poster: On the identifiability of Markov Switching Models**
ICML 2023 Workshop on Structured Probabilistic Inference & Generative Modeling, Hawaii, USA, Jul 27th 2023.

Talks and presentations (continued)

- 2022
 - 📌 **Poster: Markovian Gaussian Process Variational Autoencoders**
International Conference in Machine Learning, Hawaii, USA, Jul 25th 2023
 - 📌 **Poster: On the identifiability of Markov Switching Models**
*Cambridge Ellis Unit Summer School on Probabilistic Machine Learning, Cambridge, UK, Jul 21st 2023. *Best poster award.*
 - 📌 **Talk: On the identifiability of Markov Switching Models**
Microsoft Research Cambridge Causality Reading Group (online), Jun 14th 2023.
 - 📌 **Talk: Causal discovery from conditionally stationary time series**
When Causal Inference meets Statistical Analysis, France, Paris, April 21st 2023.
 - 📌 **Talk: Causal discovery from conditionally stationary time series**
Research visit at Université Grenoble Alpes, Grenoble, Paris, Nov 29th 2022.
 - 📌 **Poster: Causal discovery from conditionally stationary time series**
First Workshop on Causal Representation Learning at UAI, Eindhoven, Netherlands, August 5th 2022.
 - 📌 **Tutorial on Nonlinear ICA**
CSML reading group Imperial College London (online), June 23rd 2022. Slides here.
 - 📌 **Towards causal discovery in videos**
HiSS: Humanizing the Sustainable Smart city workshop (online), February 17th 2022.

Scholarships

- 2021 – 2026
 - 📌 **Teaching Scholar**
Imperial College London, London, United Kingdom.
- 2019
 - 📌 **MOBINT Scholarship**
Generalitat de Catalunya - Agència de Gestió d'Ajuts Universitaris i de Recerca, Barcelona, Spain.
 - 📌 **CFIS Scholarship for International Mobility**
Centre de Formació Interdisciplinària Superior (CFIS), Barcelona, Spain.
- 2015 – 2019
 - 📌 **CFIS Scholarship for tuition and housing**
Centre de Formació Interdisciplinària Superior (CFIS), Barcelona, Spain.
- 2014
 - 📌 **Spanish baccalaureate honours distinction**
Institut Salvador Vilaseca, Reus, Spain.

Miscellaneous

Skills

- Languages
 - 📌 English (C1), Spanish (Native), Catalan (Native)
- Coding
 - 📌 Python, Matlab, R, C++, Java, JavaScript, Basic, \LaTeX
- ML Frameworks
 - 📌 Pytorch, Keras.
- Web Dev
 - 📌 Django (Python), Flask (Python), NodeJs (JavaScript), Socket.io (NodeJs), Apache, PHP.

Achievements

- 2023
 - 📌 **Best poster award: Cambridge Ellis Unit Summer School on Probabilistic Machine Learning**
Cambridge, Jul 21st 2023.
- 2022
 - 📌 **Winning team in AI Hack 2022: Microfluidic challenge**
Imperial College London, London, United Kingdom.
- 2018
 - 📌 **Winning team in Datathon CFIS UPC-Kernel Analytics**
Universitat Politècnica de Catalunya and Kernel Analytics, Barcelona, Spain.
- 2017
 - 📌 **Runner-up price: Credit Suisse Challenge at LauzHack 2017**
École polytechnique fédérale de Lausanne (EPFL), Lausanne, Switzerland.
 - 📌 **Runner-up price: CopenHacks 2017**
Microsoft Development Center, Copenhagen, Denmark.

Miscellaneous (continued)

- **3rd place award: 2nd Hello Barcelona Bootcamp (Div. B)**
in collaboration with Moscow Workshops ACM-ICPC, Barcelona, Spain.

Programming courses

- 2019 ■ **Python and Django Full Stack Web Developer Bootcamp** by Jose Portilla. *32 hours*
- 2017 ■ **Udacity Google Developer Challenge Scholarship: Front-End Web Dev.** *40 hours*
 - **Introduction to machine learning/deep learning.** *12 hours*
 - **Hello Barcelona Programming Bootcamp (in collaboration with ACM-ICPC Workshops).** *50 hours*
- 2016 ■ **Introduction to 3D game design with Unity 5** *40 hours*