

Miquel Perelló Nieto

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Work Experience

- **Senior Research Associate** **2024 – Curr**
Bristol, UK
University of Bristol, School of Engineering Mathematics and Technology
 - Project The LEAP Digital Health Hub
 - Granted by EPSRC
- **Research Associate** **2022 – 2024**
Bristol, UK
University of Bristol, Department of Electrical and Electronic Engineering
 - Project TAILOR – Foundations of Trustworthy AI - Integration Reasoning, Learning and Optimization
 - Granted by HORIZON 2020
- **Research Associate** **2018 – 2022**
Bristol, UK
University of Bristol, Department of Electrical and Electronic Engineering
 - Project SPHERE Next Steps
 - Granted by EPSRC IRC
- **Research Associate** **2017 – 2018**
Bristol, UK
University of Bristol, Department of Electrical and Electronic Engineering
 - Project SPHERE – a Sensor Platform for HEalthcare in a Residential Environment
 - Granted by EPSRC IRC – Engineering and Physical Science Research Council an Interdisciplinary Research Collaboration
- **Research Associate** **2016 – 2017**
Bristol, UK
University of Bristol, Department of Engineering Mathematics
 - Activity recognition using multivariate time series modeling
- **Research Assistant** **2016 – 2016**
Strasbourg, France
Université de Strasbourg, ICube Laboratory
 - Project REFRAAME – Rethinking the Essence, Flexibility and Reusability of Advanced Model Exploitation
 - Granted by CHIST-ERA – European Coordinated Research on Long-term Challenges in Information and Communication Sciences & Technologies ERA-Net
- **Research Assistant** **2015 – 2016**
Bristol, UK
University of Bristol, Intelligent Systems Laboratory
 - REFRAAME project granted by CHIST-ERA
- **Research Assistant** **Mar. – May 2014**
Espoo, Finland
Aalto University School of Science
 - Unsupervised Learning of Multiple Languages Using Recurrent Neural Networks
 - On the use of Convolutional Neural Networks for spatio-temporal feature extraction
- **Software Designer/Developer & Systems Administrator** **2010 – 2013**
Barcelona, Spain
Faceras, S.L.

- Development of an **access control system along several buildings of Barcelona**.

- **Installer & Technical Service Manager**

DN Electrónica 2002, S.A.

2006 – 2010

Martorell, Spain

Education

- **Ph.D. in Computer Science**

University of Bristol

2016 – 2023

Bristol, UK

- Thesis **"Uncertainty aware classification: Augmenting classifiers to handle uncertainty"**.

- **M.Sc. in Machine Learning and Data Mining**

Aalto University School of Science

2013 – 2015

Espoo, Finland

- Thesis **"Merging chrominance and luminance in early, medium and late fusion using Convolutional Neural Networks"** with distinction.

- **M.Sc. in Artificial Intelligence**

Consortium of three universities:

Technical University of Catalonia, University of Barcelona, and Rovira i Virgili University

2012 – 2015

Catalonia, Spain

- **B.Sc. in Technical Engineer in Computer Systems**

Barcelona School of Informatics at the Technical University of Catalonia

2007 – 2012

Barcelona, Spain

- Thesis **"Design of a platform to test distributed control systems"** with distinction.

Peer-reviewed Publications

1. Tonkin, E. L., Holmes, M. H., Song, H., Twomey, N. J., Diethe, T. R., Kull, M., Perelló Nieto, M., Camplani, M., Hannuna, S. L., Fafoutis, X., Zhu, N., Woznowski, P. R., Tourte, G. J. L., Santos-Rodriguez, R., Flach, P. A. & Craddock, I. J., **A multi-sensor dataset with annotated activities of daily living recorded in a residential setting**, Scientific Data, 10, 162 (2023).
2. de Menezes e Silva Filho, T., Song, H., Perelló Nieto, M., Santos-Rodriguez, R., Kull, M. & Flach, P. A., **Classifier calibration: a survey on how to assess and improve predicted class probabilities** In: Machine Learning, 112, 9, p. 3211-3260 50 p. (May 2023)
3. Grant, S., Tonkin, E. L., Craddock, I. J., Blom, A. W., Holmes, M. H., Judge, A., Masullo, A., Perelló Nieto, M., Song, H., Whitehouse, M. R., Flach, P. A. & Gooberman-Hill, R., **Toward Enhanced Clinical Decision Support for Patients Undergoing a Hip or Knee Replacement: Focus Group and Interview Study With Surgeons** In: JMIR Perioperative Medicine, 6, 1, e36172 (Apr. 2023).
4. Yamagata, T., Tonkin, E. L., Arana Sanchez, B., Craddock, I. J., Perelló Nieto, M., Santos-Rodriguez, R., Yang, W. & Flach, P. A., **When the Ground Truth is not True: Modelling Human Biases in Temporal Annotations** ARDUOUS: Workshop at PerCom, 6 p (Jan. 2023)
5. Bi, H., Perelló Nieto, M., Tonkin, E., Santos-Rodriguez, R., Flach, P., & Craddock, I., **Recognizing human activities with attention mechanism on multi-source sensor data**. In Third International Conference on Computer Science and Communication Technology (ICCSCT 2022) (Vol. 12506, pp. 1137-1143). SPIE (Dec. 2022).
6. Poyiadzi, R., Bacaicoa-Barber, D., Cid-Sueiro, J., Perelló Nieto, M., Flach, P., & Santos-Rodriguez, R., **The Weak Supervision Landscape**. In 2022 IEEE International Conference on Pervasive Computing and Communications Workshops and other Affiliated Events (PerCom Workshops) (pp. 218-223). IEEE Computer Society (Mar. 2022).
7. Bi, H., Perelló Nieto, M., Santos-Rodriguez, R., Flach, P., & Craddock, I., **An active semi-supervised deep learning model for human activity recognition**. Journal of Ambient Intelligence and Humanized Computing, 14(10), 13049-13065 (Mar 2022).

8. Bacaicoa-Barber, D., Perelló Nieto, M., Santos-Rodriguez, R. & Cid-Sueiro, J., **On the Selection of Loss Functions Under Known Weak Label Models**, In the International Conference on Artificial Neural Networks, p. 332-343. 12 p (Sep. 2021).
9. Bi, H, Perelló Nieto, M, Santos-Rodriguez, R & Flach, PA. **Human Activity Recognition Based on Dynamic Active Learning** IEEE Journal of Biomedical and Health Informatics (Apr. 2021).
10. Morgan, C. A. M., Heidarivincheh, F., Craddock, I., Mcconville, R., Perelló Nieto, M., Tonkin, E. L., Masullo, A., Vafeas, A. T., Kim, M., Mcnane, R., Tourte, G. J. L. & Whone, A. L., **Data labelling in the wild: annotating free-living activities and Parkinson's disease symptoms**, 2021 IEEE International Conference on Pervasive Computing and Communications Workshops and other Affiliated Events, PerCom Workshops). Institute of Electrical and Electronics Engineers (IEEE), p. 471-474 4 p. 9431017 (Mar. 2021).
11. Perelló Nieto, M., Santos-Rodriguez, R., Garcia-Garcia D., Cid-Sueiro, J. **Recycling weak labels for multi-class classification** Journal of Neurocomputing, Volume 400, pp. 206-215 (2020).
12. Holmes, M., Perelló Nieto, M., Song, H., Tonkin, E. L., Grant, S. & Flach, P. A., **Modelling patient behaviour using IoT sensor data: A case-study to evaluate techniques for modelling domestic behaviour in recovery from total hip replacement surgery** Journal of Healthcare Informatics Research, 3;4(3):238-260. doi: 10.1007/s41666-020-00072-6. PMID: 35415449; PMCID: PMC8982732 (May 2020)
13. Tonkin, E. L., Perelló Nieto, M., Bi, H. & Vafeas, A. T., **Towards a methodology for acceptance testing and validation of monitoring bodyworn devices**, 2020 IEEE International Conference on Pervasive Computing and Communications Workshops (PerCom Workshops). IEEE Computer Society, 6 p. Research output: Chapter in Book/Report/Conference proceeding › Conference Contribution, Conference Proceeding (Aug. 2020).
14. Kull, M., Perelló Nieto, M., Kängsepp, M., Silva Filho, T., Song, H., Flach, P. **Beyond temperature scaling: Obtaining well-calibrated multiclass probabilities with Dirichlet calibration**, In Advances in Neural Information Processing Systems, pp. 12295-12305 (2019).
15. Holmes, M., Song, H., Tonkin, E. L., Perelló Nieto, M., Grant, S. & Flach, P., **Analysis of patient domestic activity in recovery from hip or knee replacement surgery: modelling wrist-worn wearable RSSI and accelerometer data in the wild**, Proceedings of the 3rd International Workshop on Knowledge Discovery in Healthcare Data: co-located with the 27th International Joint Conference on Artificial Intelligence and the 23rd European Conference on Artificial Intelligence (IJCAI-ECAI 2018). CEUR Workshop Proceedings, p. 13-20 8 p., CEUR Workshop Proceedings; vol. 2148 (Jul 2018).
16. Diethe, T., Perelló Nieto, M., Tonkin, E., Holmes, M., Sokol, K., Twomey, N., Kull, M., Song, H. & Flach, P., **Releasing eHealth analytics into the wild: Lessons learnt from the SPHERE project**. KDD'18: Proceedings of the 24th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining. Association for Computing Machinery (ACM), pp. 243-252 (2018)
17. Perelló Nieto, M., Santos-Rodriguez, R. and Cid-Sueiro, J. **Adapting Supervised Classification Algorithms to Arbitrary Weak Label Scenarios**, in Advances in Intelligent Data Analysis XVI: 16th International Symposium, IDA 2017, London, UK, October 26–28, Proceedings. Springer Verlag, pp. 247-259 (2017)
18. Perelló Nieto, M., Silva Filho, T.M., Kull, M. & Flach, P., **Background Check: A general technique to build more reliable and versatile classifiers**, in IEEE 16th International Conference on Data Mining (ICDM2016), Barcelona, Spain (Dec. 2016).
19. Fuertes, J. M., Villà, R., Ayza, J., Mars, P., Martí, P., Velasco, M., Yopez, J., Torres, G., & Perelló Nieto, M., **Hands-on Course in Networked Control Systems**, Spain. In 20th Mediterranean Conference on Control and Automation (MED2012), Barcelona, Spain (Aug. 2012).
20. Fuertes, J. M., Villà, R., Ayza, J., Mars, P., Martí, P., Velasco, M., Yopez, J., Torres, G., & Perelló Nieto, M. **Design of a Hands-on Course in Networked Control Systems** XV Jornadas de Tiempo Real, Santander, Spain (Feb. 2012).

Other Publications

1. Flach, P., Perelló Nieto, M., **PhD program, proposal for a joint TAILOR PhD curriculum Report**. Foundations of Trustworthy AI - Integrating Reasoning, Learning and Optimization (TAILOR) (Apr. 2023)
2. Perelló Nieto, M., **Uncertainty aware classification: Augmenting classifiers to handle uncertainty**. Ph.D. Student thesis, University of Bristol, Computer Science (May 2023).
3. Flach, P., Perelló Nieto, M., **AI-Driven Collaboration Tools Report**. Foundations of Trustworthy AI - Integrating Reasoning, Learning and Optimization (TAILOR) (Oct. 2022)

4. Diethe, T., Kull, M., Twomey, N., Sokol, K., Song, H., Perelló Nieto, M., Tonkin, E. & Flach, P. **HyperStream: a Workflow Engine for Streaming Data**, In : arXiv (Aug. 2019)
5. Perelló Nieto, M., **Merging chrominance and luminance in early, medium, and late fusion using Convolutional Neural Networks**. M.Sc. Student thesis. Aalto University, Master's Programme in Machine Learning and Data Mining (2015).
6. Fuertes, J. M., Villa, R., Ayza, J., Mares, P., Marti, P., Velasco, M., Yopez, J., Torres, G., & Perelló Nieto, M., **Design of a hands-on course in networked control systems**. Research report ESAIL-RR-12-01, Automatic Control Department, <http://hdl.handle.net/2117/18144> (Jan. 2012)
7. Perelló Nieto, M. **Design of a platform to test distributed control systems**. B.Sc. Student thesis. Universitat Politècnica de Catalunya. Facultat d'Informàtica de Barcelona. Departament d'Enginyeria de Sistemes, Automàtica i Informàtica Industrial (ET d'Informàtica de Sistemes (Pla 2003)) (Jan. 2012).

Peer Reviewing

- Program Committee member ECML-PKDD 2020, 2023, 2024
- Programme Committee member ECAI 2024
- Reviewer for the Journal of Visual Communication and Image Representation 2019, 2022
- Reviewer for Neurocomputing 2020, 2021, 2022, 2023
- Reviewer at SafeAI 2021
- Reviewer for the Royal Society Open Science 2022
- Reviewer for the Journal of Artificial Intelligence Review 2023, 2024
- Reviewer for the Journal of Knowledge and Information Systems 2023
- Reviewer for the International Journal of Data Science and Analytics 2024
- Reviewer for the Machine Learning journal 2024
- Reviewer for the Journal of Signal, Image and Video Processing 2024

Academic Supervision

- Helped the supervision of Seow Voon Ng (B.Sc. Maths & Computer Science, UoB) 2015
- Helped the supervision of Alex Dantis (B.Sc. Computer Science, UoB) 2016
- Helped the supervision of Yuefeng Li (M.Sc. Advanced Computing, UoB) 2017
- Helped the supervision of Ioannis Koutoulakis (M.Sc. Advanced Computing, UoB) 2017

Other Academic and Volunteer Activities

- Bristol PLUS Award 2017
- Co-organiser of the first PyData Bristol Meetup 2017-2020
- Awarded an NVIDIA GPU Grant (TITAN V) 2018
- Attended Machine Learning Summer School (Madrid) 2018
- SPHERE exhibit at We The Curious 2018
- Attended Amazon Research Days Cambridge 2018
- Group facilitator at a Data Study Group (The Alan Turing Institute) 2019
- Workshop about Digital Health for Year 9 students (Shape Your World - Future Quest) 2019
- Co-organised the Classifier Calibration tutorial at ECML-PKDD 2020
- Short lecture in the unit Intro to AI, University of Bristol 2020
- Researcher volunteer CLAIRE COVID-19 initiative 2020
- Speaker for the Jean Golden Institute, Data Week Online (Collecting Big Data from Family Homes) 2021
- Attended ACAI-TAILOR Summer School (Barcelona) 2022
- Q&A Session in Machine Learning Paradigms, University of Bristol 2023

Open Source Contributions

• Teaching material for Distributed Control Systems	2011
• Open Source Tetris for Arduino & 4Display-Shield (YouTube video)	2012
• Teaching material for Artificial Neural Networks	2015
• Teaching material for Convolutional Neural Networks	2015
• Open Source Python library DiaryPy	2015
• Synthetic generator of OCR data	2015
• Python code DeepTrip (YouTube video)	2015
• Python code for Precision Recall Gain curves	2016
• Notes taking tool Diary	2017
• Python package PyDatasets	2018
• Python package dirichlet_python	2018
• Python package bHealth (Bristol Health)	2019
• Teaching material on how to use Blue Crystal phase 4	2019
• Material, videos and workshops from PyData Bristol	2020
• Python package PyCalib	2021