

# 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, EPSRC
  - **Research Associate** **2017 – 2024**  
Bristol, UK  
*University of Bristol*
    - Project TAILOR – Trustworthy AI - Integration Reasoning, Learning and Optimization, HORIZON 2020
    - Project SPHERE Next Steps, EPSRC IRC
    - Project SPHERE – a Sensor Platform for HEalthcare in a Residential Environment, EPSRC IRC
  - **Research Assistant** **2016 – 2016**  
Strasbourg, France  
*Université de Strasbourg, ICube Laboratory*
    - Project REFRAME – Rethinking the Essence, Flexibility and Reusability of Advanced Model Exploitation, 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*
    - REFRAME project, CHIST-ERA
  - **Research Assistant** **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 Developer & Systems Administrator** **2010 – 2013**  
Barcelona, Spain  
*Faceras, S.L.*
    - Development of an [access control system along several buildings in Barcelona](#).
  - **Installer & Technical Service Manager** **2006 – 2010**  
Martorell, Spain  
*DN Electrónica 2002, S.A.*
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## Education

- **Ph.D. in Computer Science** **2016 – 2023**  
Bristol, UK  
*University of Bristol*
  - Thesis ["Uncertainty aware classification: Augmenting classifiers to handle uncertainty"](#).

- **M.Sc. in Machine Learning and Data Mining**  
*Aalto University School of Science*

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

**2013 – 2015**  
*Espoo, Finland*
- **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*

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

**2007 – 2012**  
*Barcelona, Spain*

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## Peer-reviewed Publications

1. Noé, P. G., Perelló Nieto, M., Bonastre, J. F., & Flach, P., **Explaining a probabilistic prediction on the simplex with Shapley compositions** In: European Conference of Artificial Intelligence (ECAI), 392, p. 1124 – 1131, doi: 10.3233/FAIA240605 (Oct. 2024).
2. 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).
3. 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)
4. 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).
5. 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)
6. 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).
7. 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).
8. 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).
9. 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).
10. 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).
11. 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).
12. 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).

13. 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)
14. 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).
15. 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).
16. 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).
17. 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)
18. Perelló Nieto, M., Santos-Rodríguez, 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)
19. 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).
20. Fuertes, J. M., Villà, R., Ayza, J., Mars, P., Martí, P., Velasco, M., Yezpez, 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).
21. Fuertes, J. M., Villà, R., Ayza, J., Mars, P., Martí, P., Velasco, M., Yezpez, 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).

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## 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., Martí, P., Velasco, M., Yezpez, J., Torres, G., & Perelló Nieto, M., **Design of a hands-on course in networked control systems**. Research report ESAII-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).
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## Peer Reviewing

- Reviewer for the Journal of Visual Communication and Image Representation 2019, 2022
  - Program Committee member ECML-PKDD 2020, 2023, 2024
  - Reviewer for Neurocomputing 2020, 2021, 2022, 2023
  - Reviewer at SafeAI 2021
  - Reviewer for the Royal Society Open Science 2022
  - Reviewer for the Journal of Knowledge and Information Systems 2023
  - Reviewer for the Journal of Artificial Intelligence Review 2023, 2024
  - 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
  - Programme Committee member ECAI 2024
  - Reviewer for the LEAP Hub, grant applications 2024
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## Academic Supervision

- Co-supervision final year project in B.Sc. Maths & Computer Science, UoB 2015
  - Co-supervision final year project in B.Sc. Computer Science, UoB 2016
  - Co-supervision final year project in M.Sc. Advanced Computing, UoB 2017
  - Co-supervision final year project in M.Sc. Advanced Computing, UoB 2017
  - Supervision final year project in M.Eng. Engineering Mathematics, UoB 2024
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## 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
  - Co-organised a Workshop about Digital Health for Year 9 students (Shape Your World - Future Quest) 2019
  - Co-organised the Classifier Calibration tutorial at ECML-PKDD 2020
  - Invited talk in the unit Intro to AI, UoB 2020
  - Researcher volunteer CLAIRE COVID-19 initiative 2020
  - Speaker for the Jean Golden Institute, Data Week (Collecting Big Data from Family Homes) 2021
  - Attended ACAI-TAILOR Summer School (Barcelona) 2022
  - Q&A Session in Machine Learning Paradigms, UoB 2023
  - Co-organised a workshop New Ways of Academic Publishing, UoB 2024
  - Co-organised a workshop Quarto Hands-on Workshop, UoB 2024
  - Co-supervision of group projects in the Practice Projects in AI, Practice-Oriented AI CDT, UoB 2024
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## Open Source Contributions

• Teaching material for Distributed Control Systems (YouTube Playlist)	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