Miquel Perelló Nieto

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Education

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

- **M.Sc. in Machine Learning and Data Mining** — 2013 – 2015
  Aalto University School of Science — *Espoo, Finland*
  - Thesis **"Merging chrominance and luminance in early, medium and late fusion using Convolutional Neural Networks"** with distinction.

- **M.Sc. in Artificial Intelligence** — 2012 – 2015
  Consortium of three universities: — *Catalonia, Spain*
  Technical University of Catalonia, University of Barcelona, and Rovira i Virgili University

- **B.Sc. in Technical Engineer in Computer Systems** — 2007 – 2012
  Barcelona School of Informatics at the Technical University of Catalonia — *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**16 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., Mcnaney, 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-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)

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., Yepez, 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., Yepez, 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., Yepez, 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).

Work Experience

- **Research Associate**   **2022 – Curr**
  University of Bristol, Department of Electrical and Electronic Engineering   *Bristol, UK*
  - Project TAILOR – Foundations of Trustworthy AI - Integration Reasoning, Learning and Optimization
  - Granted by HORIZON 2020

- **Research Associate**   **2018 – 2022**
  University of Bristol, Department of Electrical and Electronic Engineering   *Bristol, UK*
  - Project SPHERE Next Steps
  - Granted by EPSRC IRC

- **Research Associate**   **2017 – 2018**
  University of Bristol, Department of Electrical and Electronic Engineering   *Bristol, UK*
  - 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**
  University of Bristol, Department of Engineering Mathematics   *Bristol, UK*
  - Activity recognition using multivariate time series modeling

- **Research Assistant**   **2016 – 2016**
  Université de Strasbourg, ICube Laboratory   *Strasbourg, France*
  - Project REFRAME – 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**
  University of Bristol, Intelligent Systems Laboratory   *Bristol, UK*
  - REFRAME project granted by CHIST-ERA

- **Research Assistant**   **Mar. – May 2014**
  Aalto University School of Science   *Espoo, Finland*
  - 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**
  Faceras, S.L.   *Barcelona, Spain*
  - Development of an **access control system along several buildings of Barcelona**.

- **Installer & Technical Service Manager**   **2006 – 2010**
  DN Electrónic 2002, S.A.   *Martorell, Spain*

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 Artificial Intelligence Review   2023
- Reviewer for the Journal of Knowledge and Information Systems   2023
- Programme Committee member ECAI   2024
- Reviewer for the Machine Learning journal   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