Weronika Wojtak

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EDUCATION

University of Minho, Portugal   2016 – 2021
PhD in Applied Mathematics
- Final grade: Very good
- Funding: FCT through the PhD fellowship PD/BD/128183/2016

University of Zielona Góra, Poland   2012 – 2013
M.S. in Computer Science
- Final grade: 5/5
- Diploma recognized at the University of Minho (no. 65/2016) with the final grade 19/20.

University of Zielona Góra, Poland   2008 – 2012
B.S. in Biomedical Engineering
- Final grade: 5/5
- Diploma recognized at the University of Minho (no. 64/2016) with the final grade 19/20.

EXPERIENCE

Researcher   December 2020 – present
University of Minho, Centre Algoritmi

Early Stage Researcher   October 2013 – August 2016
University of Minho, Centre Algoritmi
- Member of the Neural Engineering Transformative Technologies (NETT) Consortium,
  The European Marie Curie Funded ITN no. 289146

VISITING POSITIONS

Academic secondment   March 2015 – May 2015
University of Nottingham, UK

PUBLICATIONS

Preprints

Wojtak, W., Ferreira, F., Louro, L., Bicho, E., & Erlhagen, W. (2022). *Adaptive timing in a dynamic field architecture for natural human-robot interactions.* Cognitive Systems Research, *submitted.*

Journal articles

Wojtak, W., Coombes, S., Avitabile, D., Bicho, E., & Erlhagen, W. (2023). *Robust working memory in a two-dimensional continuous attractor network.* Cognitive Neurodynamics, 1-17.

Wojtak, W., Coombes, S., Avitabile, D., Bicho, E., & Erlhagen, W. (2021). *A dynamic neural field model of continuous input integration.* Biological Cybernetics, 115(5), 451-471.

Wojtak, W., Ferreira, F., Vicente, P., Louro, L., Bicho, E., & Erlhagen, W. (2020). *A neural integrator model for planning and value-based decision making of a robotics assistant.* Neural Computing and Applications 33(8), 3737-3756.

Ferreira, F., **Wojtak, W.**, Sousa, E., Louro, L., Bicho, E., & Erlhagen, W. (2020). *Rapid learning of complex sequences with time constraints: A dynamic neural field model.* IEEE Transactions on Cognitive and Developmental Systems, 13, 853-864.

Wojtak, W., Silva, C. J., & Torres, D. F. (2018). *Uniform asymptotic stability of a fractional tuberculosis model.* Mathematical Modelling of Natural Phenomena, 13(1), 9.

Peer-reviewed conference proceedings

Barbosa, P., Ferreira, F., Fernandes, C., Erlhagen, W., Guimarães, P., **Wojtak, W.**, Monteiro, S., & Bicho, E. (2022). *Endowing Intelligent Vehicles with the Ability to Learn User's Habits and Preferences with Machine Learning Methods.* In International Conference on Intelligent Data Engineering and Automated Learning (pp. 157-169). Springer, Cham.

Wojtak, W., Ferreira, F., Guimarães, P., Barbosa, P., Monteiro, S., Erlhagen, W., & Bicho, E. (2021). *Towards endowing intelligent cars with the ability to learn the routines of multiple drivers: a dynamic neural field model.* In International Conference on Computational Science and Its Applications (pp. 337-349). Springer, Cham.

Ferreira, F., **Wojtak, W.**, Fernandes, C., Guimarães, P., Monteiro, S., Bicho, E., & Erlhagen, W. (2021). *Dynamic identification of stop locations from GPS trajectories based on their temporal and spatial characteristics.* In International Conference on Artificial Neural Networks (pp. 347-359). Springer, Cham.

Wojtak, W., Ferreira, F., Bicho, E., & Erlhagen, W. (2019). *Neural Field Model for Measuring and Reproducing Time Intervals.* In International Conference on Artificial Neural Networks (pp. 327-338). Springer, Cham.

Wojtak, W., Ferreira, F., Bicho, E., & Erlhagen, W. (2019). *Numerical analysis of the shape of bump solutions in a neuronal model of working memory.* In AIP Conference Proceedings (Vol. 2116, No. 1, p. 250003). AIP Publishing LLC.

Wojtak, W., Ferreira, F., Louro, L., Bicho, E., & Erlhagen, W. (2017). *Towards temporal cognition for robots: a neurodynamics approach.* In 2017 Joint IEEE International Conference on Development and Learning and Epigenetic Robotics (ICDL-EpiRob) (pp. 407-412). IEEE.

Wojtak, W., Coombes, S., Bicho, E., & Erlhagen, W. (2016). *Combining spatial and parametric working memory in a dynamic neural field model.* In International Conference on Artificial Neural Networks (pp. 411-418). Springer, Cham.

Wojtak, W., Ferreira, F., Erlhagen, W., & Bicho, E. (2015). *Learning joint representations for order and timing of perceptual-motor sequences: a dynamic neural field approach.* In 2015 International Joint Conference on Neural Networks (IJCNN) (pp. 1-7). IEEE.

Filipczuk, P., **Wojtak, W.**, & Obuchowicz, A. (2012). *Automatic nuclei detection on cytological images using the firefly optimization algorithm.* In Information Technologies in Biomedicine (pp. 85-92). Springer, Berlin, Heidelberg.

Others

Ferreira, F., **Wojtak, W.**, Erlhagen, W., Vicente, P., Patel, A., Monteiro, S., & Bicho, E. *A dynamic neural model for endowing intelligent cars with the ability to learn driver routines: where to go, when to arrive and how long to stay there?* In Cognitive Vehicles Workshop - IROS 2019.

COMMUNICATIONS

Talks

Towards new generations of autonomous intelligent systems: an approach based on mathematical modeling of brain functions at Neuromatch 4.0 Conference, December 2021, Online

A novel dynamic field model supporting a continuum of bump amplitudes at Second International Symposium on the Mathematics of Neuroscience, Technology and Engineering, September 2021, Rhodes, Greece / Online

Towards endowing intelligent cars with the ability to learn the routines of multiple drivers: a dynamic neural field model at International Conference on Computational Science and Its Applications (ICCSA), September 2021, Cagliari, Italy / Online

A novel dynamic field model supporting a continuum of bump amplitudes at National Meeting of the Portuguese Mathematical Society (ENSPM21), July 2021, Online

Multiple bumps in a neural field model with a "Mexican hat" connectivity at 7th International Conference on Mathematical Neuroscience (ICMNS), June/July 2021, Online

Neural field model for measuring and reproducing time intervals at 3rd CMAT Open Day, October 2019, Braga, Portugal

Neural field model for measuring and reproducing time intervals at 28th International Conference on Artificial Neural Networks, September 2019, Munich, Germany

Numerical continuation of solutions of neural field equations with oscillatory coupling functions at 2nd CMAT Open Day, October 2018, Vila Real, Portugal

Numerical analysis of the shape of bump solutions in a neuronal model of working memory at 16th International Conference on Numerical Analysis and Applied Mathematics, September 2018, Rhodes, Greece

Numerical continuation of solutions of neural field equations with oscillatory coupling functions at Summer School - PhD Programs in Mathematics, September 2018, Aveiro, Portugal

Numerical continuation of solutions of neural field equations with oscillatory coupling functions at National Meeting of the Portuguese Mathematical Society, July 2018, Bragança, Portugal

Numerical analysis of solutions of neural field equations with oscillatory coupling functions at 5th Workshop on Computational Data Analysis and Numerical Methods, May 2018, Felgueiras, Portugal

Towards temporal cognition for robots: a neurodynamics approach at 7th Joint IEEE International Conference on Development and Learning and on Epigenetic Robotics, September 2017, Lisbon, Portugal

Modeling spatial and parametric working memory using dynamic neural field models at 2nd International Conference in Mathematical Modeling, September 2017, Gdańsk, Poland

Combining spatial and parametric working memory in a dynamic neural field model at 25th International Conference on Artificial Neural Networks, September 2016, Barcelona, Spain

Conferences posters

A neural field model of continuous input integration at 6th International Conference on Mathematical Neuroscience (ICMNS), July 2020, Online

Neural field model of matching law behavior at 5th International Conference on Mathematical Neuroscience (ICMNS), June 2019, Copenhagen, Denmark

A novel dynamic field model supporting a continuum of bump amplitudes: Analysis and Applications Neuro-inspired Computation Course, March 2019, Tokyo, Japan

Numerical continuation of solutions of neural field equations with oscillatory coupling functions at 4th International Conference on Mathematical Neuroscience (ICMNS), June 2018, Juan-les-Pins, France

Awards

Best poster award at Towards Cognitive Vehicles Workshop (TCV2019), IROS 2019

Third Prize at the International Collegiate Competition for Brain-inspired Computing 2019 (ICCBC 2019)

Additional training (selected)

Neuromatch Academy Deep Learning Course August 2021
Online

Neuro-inspired Computation Course March 2019
University of Tokyo, Japan

HBP Curriculum workshop - Cognitive systems for non-specialists March 2018
Technical University of Munich, Germany

Winter School on Deterministic and Stochastic Models in Neuroscience December 2017
Institut de Mathématiques de Toulouse, France