

Luciano Melodia

Curriculum vitae

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 📄 [melodia_l_1](#) ♂ Born on 27.03.1994
 📄 0000-0002-7584-7287 📖 Bavaria, Germany

PROFESSIONS

- 2024–25 Private tutor in German and mathematics.
- Abitur preparation for 8 students from the Bavarian Gymnasium in maths.
 - Secondary school (10th grade) preparation for 1 student in German and maths.
- 2023–24 Tutor Algebra and Geometry, Representation Theory and Operator Algebras, FAU¹.
- Planning and implementation of the exercise lesson in „Topology and Applications“.
 - Planning and implementation of the exercise lesson in „Topology“.
 - Planning and implementation of the exercise lesson in „Linear algebra I“.
 - Planning and conducting intensive proof lessons.
 - Examination supervision and correction.
- 2021–22 Working student Corscience GmbH & Co. KG, Erlangen.
- Automatic detection of calibration spikes and time stamps in ECG data.
 - Detection of multiple ECG curves on documents.
 - Image segmentation using machine learning.
- 2019–21 Researcher Siemens Energy AG, Erlangen.
- Programming with CUDA v.11.0, Tensorflow 2.4, CuDNN v.8.0.4.
 - Programming in Python v.3.8 and v.3.9.
 - Work with Ubuntu 20.04, Solus 4, Archlinux 5.11.
 - Implementation and use of convolutional nets, LSTM nets, residual nets, autoencoders, topological autoencoders, and Boltzmann machines for processing time series.
- 2018–21 Researcher Chair of Computer Science 6, FAU.
- Correction of written exams and assistance in oral exams.
 - Self-directed preparation and execution of e-exams.
 - Corrections to module descriptions for the Data Science program.
- 2015–18 Data scientist at mb Support GmbH, Regensburg.
- Implementation of a document pipeline for mass digitization of handwritten documents using neural networks and incorporation into the database application openVIVA.
 - Installation of the telecommunication interface ASTERISK in openVIVA.
 - Induction of new employees in openVIVA.
 - Statistical data and market analysis.
- 2013–15 Research assistant Chair of German Linguistics, Regensburg University.
- Examination correction, correction of books and texts.
 - Website maintenance.
 - Organization and conduct of conferences.
 - Implementation of the punc.space web platform.

¹ Friedrich-Alexander University Erlangen-Nürnberg.

- 2012–15 Chef in event gastronomy at Apostelkeller, Regensburg.
- Cooking according to fixed menu for up to 140 guests.
 - Waitressing and stock management.
- 2012–15 Staff-based services Trademarketing Service GmbH, Salzgitter.
- Goods management and ordering.
 - Goods admission.
- 2012–14 Translator at Anatol GmbH & Co. KG, Regensburg.
- Italian – German translation.
 - Polish – German translation.
 - English – German translation.
- 2010 Compassion project, Alten- und Pflegeheim St. Josef, Regensburg.

ACADEMIC WORK

- Teaching
- Department of Mathematics, Friedrich-Alexander Universität Erlangen-Nürnberg
 - 2024 Exercises in Topology and Applications
 - 2024 Exercises in Linear Algebra I
 - 2023 Exercises in Topology
 - Department of Computer Science, Friedrich-Alexander Universität Erlangen-Nürnberg
 - 2021 Lecture Knowledge Discovery in Databases
 - 2020 Seminar Persistent Homology in Data AnalyticsSeminar
 - 2020 Seminar Topological Data Analysis
 - 2019-21 Exercises Process Oriented Information Systems
 - 2018-21 Seminar New Technologies in Data Management
 - 2018-21 Exercises Computer Science for Engineers
 - 2018 Exercises Conceptional Modeling
- Conferences
- Learning on Graphs (LOG, 2023, 2022)
 - 15th International Conference on Advances in Databases, Knowledge, and Data Applications (DBKDA, 2023)
 - International Conference on Learning Representations (ICLR, 2022)
 - Machine Learning for Irregular Time Series (ML4ITS, 2021)
 - International Conference on Pattern Recognition (ICPR, 2021)
 - Topological Data Analysis and Beyond (NeuRIPS, 2020)
 - International Conference on Practical Mathematical Discourse (ICPMD, 2020)
 - International Workshop on Combinatorial Image Analysis (IWCIA, 2020)
 - European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML/PKDD, 2020, 2019)
 - Symposium on Principles of Database Systems (SIGMOD/PODS, 2019)
 - Kolloquium zum Sprachmanagement (2017)
 - Destandardisierung und Standardvarietät (2013)
- Service
- Reviewer Learning on Graphs (LOG, 2023, 2022)
 - Reviewer International Conference on Advances in Databases, Knowledge, and Data Applications (DBKDA, 2023, 2020)
 - Reviewer Geometrical and Topological Representation Learning (ICLR, 2022)
 - Reviewer Topological Data Analysis and Beyond (NeuRIPS, 2021)
 - Member Gesellschaft für Informatik e.V. (2019 – 20)
 - Member Computational Intelligence and Machine Learning Group (2017 – 18)
 - Student Representative Information Science (Regensburg University, 2016)

Supervision

B.Sc. D. Hahn (2021):

Classification of Sensor Signals from Power Plants.

M.Sc. C. Sauerhammer (2021):

A Classification Dashboard for Sensor Signals from Power Plants.

B.Sc. J. Schäfer (2021):

Learning Validation Models from Sensors of a Power Plant.

M.Sc. M. Seidel (2020):

Classification of Microbes using Time Series Gas Sensor Array Data.

M.Sc. M.R. Siddiqui (2020):

Extraction of Fetal and Maternal Heartbeats from ECG Signals.

PAPERS

- 2023  **Luciano Melodia:** Notes on Simplicial and Singular Homology. Friedrich-Alexander Universität Erlangen-Nürnberg, Preprint.
- 2021  **Luciano Melodia** and **Richard Lenz:** Homological Time Series Analysis of Sensor Signals from Power Plants. Machine Learning for Irregular Time Series. Machine Learning and Principles and Practice of Knowledge Discovery in Databases. In **Michael Kamp**, **Irena Koprinska**, **Adrien Bibal** et al. (ed.): Communications in Computer and Information Science. Springer Nature, Switzerland.
- 2021  **Luciano Melodia** and **Richard Lenz:** Estimate of the Neural Network Dimension Using Algebraic Topology and Lie Theory. Image Mining. Theory and Applications VII. Pattern Recognition and Information Forensics. In **Alberto Del Bimbo**, **Rita Cucchiara**, **Stan Sciaroff** et al. (ed.): Lecture Notes in Computer Science. Springer Nature, Switzerland.
- 2020  **Luciano Melodia** and **Richard Lenz:** Persistent Homology as Stopping-Criterion for Voronoi Interpolation. Proceedings of the International Workshop on Combinatorial Image Analysis. In **Tibor Lukić**, **Reneta Barneva**, **Valentin Brimkov** et al. (ed.): Lecture Notes in Computer Science. Springer, Cham.
- 2018  **Luciano Melodia:** Deep Learning Schätzung zur absorbierten Strahlungs-dosis für die nuklearmedizinische Diagnostik. Library of the **University of Regensburg**, **Master Thesis** in Information Science.
- 2015  **Luciano Melodia:** Zur Verwendung des Paradigmas brauchen mit und ohne zu mit Infinitiv. In **Katešina Šichová**, **Reinhard Krapp**, **Rössler Paul** et al. (ed.): Standardvarietät des Deutschen – Fallbeispiele aus der sozialen Praxis, Logos, Berlin.

EDUCATION

- 2024 – 26 **Mathematics M.Sc.**
Friedrich-Alexander University Erlangen-Nürnberg.
- 2021 – 24 **Mathematics B.Sc.**
Thesis: "Algebraic and topological persistence".
Minor: computer science, Friedrich-Alexander University Erlangen-Nürnberg.
- 2015 – 18 **Information Science M.A.**
Thesis: "Deep learning estimation of absorbed radiation dose for nuclear medicine diagnostics".
Minor: biophysics, Regensburg University.
- 2012 – 15 **German Philology B.A.**
Thesis: "Development of an application for punctuation research using linguistic

modules for information retrieval”.

Majors: italian philology, information science, media informatics, Regensburg University.

2012 – 13

Web Developer, Rechenzentrum Regensburg University.

2012

Abitur, Albertus-Magnus-Gymnasium, Regensburg.

INTERESTS

Coding

Python, JavaScript.

Software

GUDHI, Dionysus, Keras.

Languages

German (native), English C2, Italian C2, Polish B2.

Hobbies

Cooking, Reading.

Sports

Muay Thai.