DANIELE PALA

CURRICULUM VITAE

Date of birth: November 3rd, 1992 Segrate (Italy)
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CURRENT POSITION

Apr 2022 – Ongoing: **POSTDOCTORAL RESEARCHER**
University of Pennsylvania – Perelman School of Medicine

Development of machine learning-based strategies to predict the progression of Alzheimer's Disease from GWAS data, brain imaging data and environmental exposures.

Shen Lab, Department of Biostatistics, Epidemiology and Informatics
Supervisor: Prof. Li Shen

Apr 2021 – Ongoing: **ADJUNCT PROFESSOR**
Università degli Studi di Pavia

Professor of the course "Principi di Informatica" (Principles of Informatics) at the Faculty of Medicine and Surgery.

PREVIOUS POSITIONS

Dec 2020 – Mar 2022: **POSTDOCTORAL RESEARCHER**
Università degli Studi di Pavia

Creation of machine learning and statistical models based on remote sensing, land use regression and satellite data to assist Multiple Sclerosis patients and study their disease progression related to environmental exposures in the contest of the EU BRAINTEASER Project.

Design and development of the European Covid-19 Atlas in the context of the EU PERISCOPE Project.

Laboratory for Biomedical Informatics
Supervisor: Prof. Riccardo Bellazzi

Sep 2018 – Feb 2019: **VISITING PhD STUDENT**
College of Global Public Health – New York University, New York, USA.

Integration of multi-source data to study the relations among air pollutants, socioeconomic and demographic factors and asthma and diabetes hospitalizations in the different neighborhoods of New York City; construction of an Agent-Based Model for the simulation of public health interventions to prevent asthma in the city.

Sep 2018 – Feb 2019: **RESEARCH COLLABORATOR**
Center of Health Innovation – The New York Academy of Medicine.

Analysis and integration of New York State's SPARCS dataset (Statewise Planning and Research Cooperative System) in the PULSE system.

May 2017 – Sep 2017: **RESEARCH FELLOW**
Università degli studi di Pavia – Dipartimento di ingegneria industriale e dell'informazione

Development of matrix trifactorization methods for the computation of patient similarity through integration of highly heterogeneous clinical, genetic, functional and diagnostic data.

EDUCATION

Sep 2017 – Nov 2020: **PhD in BIOENGINEERING AND BIOINFORMATICS**
Università degli Studi di Pavia

Dissertation title: Spatial Enablement and Simulation Tools to Improve Public Health and Wellbeing in Big Cities: a New Framework Based on the European PULSE Project.

Laboratory for Biomedical Informatics
Supervisor: Prof. Riccardo Bellazzi

Feb 2015 – Apr 2017: **MASTER'S DEGREE IN BIOENGINEERING**
Università degli studi di Pavia – Dipartimento di ingegneria industriale e dell'informazione

Final mark: 110/110
Thesis: "Matrix tri-factorization algorithms for the computation of patient similarity with heterogeneous data: development and applications"
Laboratory for Biomedical Informatics, University of Pavia (Italy)
Advisor: Prof. Riccardo Bellazzi

Sep 2011 – Feb 2015: **BACHELOR'S DEGREE IN BIOENGINEERING**
Università degli studi di Pavia – Dipartimento di ingegneria industriale e dell'informazione

Advisor: Prof. Giovanni Magenes

Sep 2006 – Jul 2011: **SCIENTIFIC HIGH SCHOOL DIPLOMA**
Liceo Scientifico Lorenzo Mossa, Olbia

Final mark: 100/100 with honors

LANGUAGE SKILLS

ENGLISH
Speaking, writing and listening: fluent

SPANISH
Speaking, writing and listening: basic knowledge

ACADEMIC ACHEIVEMENTS

PROGRAMMING LANGUAGES: MATLAB, R, Python, Stata, SQL, C, Java, HTML
SOFTWARES: MATLAB, Orange, Microsoft Office, QGIS, ArcGIS, NetLogo, Stata

MACHINE LEARNING: Advanced machine learning, classification and clustering techniques with diagnostic and research applications. Fundamentals of Deep Learning and Vision Learning. Temporal series. Ensemble classifiers. Transfer Learning. Data Fusion algorithms. Data mining and

database analysis.

STATISTICAL ANALYSIS: Advanced Statistical Analysis, probability distributions, univariate and multivariate hypothesis testing, Bayesian approaches, fundamentals of epidemiology and statistics in epidemiology, evaluation of medical tests' performance.

EPIDEMIOLOGY: Design of an epidemiological study, applications of Machine Learning and geostatistics to the fields of Epidemiology and Public Health. Enrollment of volunteers for epidemiological studies, technological support on urban Public Health interventions design.

BIOINFORMATICS: Tools and methods for studying the structures and function of biological sequences (DNA sequencing and analysis, Hidden Markov Models, Alignment).

AGENT-BASED MODELING: Construction of Agent-Based Models with applications in Public Health, Epidemiology and Sociology. Integration of GIS technology in the Agent-Based programming environment.

GEOGRAPHIC INFORMATION SYSTEMS: Construction of a GIS, integration of a geo-referenced database in a GIS, geostatistical analyses (spatial clustering and classification, geographic weighted regression, land use regression),

DECISION THEORY: Medical decision support, risk evaluation and Management, costs analyses. Decision trees and Bayesian nets.

BIOMIMETIC SYSTEMS: Brain structure and motor control, perception, memory, discrimination, awareness and learning processes, neural networks, fuzzy logic, genetic algorithms.

MATHEMATICAL MODELING: Mathematical models of biological structures, pharmacokinetics, pharmacodynamics, enzymatic reactions, population dynamics. Optimization techniques, genetic algorithms.

BIOIMAGING: Image acquisition from diverse sources (MRI, CT, echography, angiography), segmentation and registration 2D and 3D methods, volume rendering and motion analyses.

PUBLICATIONS

Pala, D.; Pagàn, J.; Parimbelli, E.; Rocca, M.T.; Bellazzi, R.; Casella, V.: Spatial enablement to support environmental, demographic, socioeconomics and health data integration and analysis for big cities: a case study with asthma hospitalizations in New York City, *Frontiers in Medicine, Volume 6, Page 84* DOI: 10.3389/fmed.2019.00084

Pala, D.; Parimbelli, E.; Larizza, C.; Cheng, C.; Ottaviano, M.; Pogliaghi, A.; Đukić, G.; Jovanović, A.; Milićević, O.; Urošević, V.; Cerchiello, P.; Giudici, P.; Bellazzi, R. A New Interactive Tool to Visualize and Analyze COVID-19 Data: The PERISCOPE Atlas. *Int. J. Environ. Res. Public Health* 2022, *19*, 9136. https://doi.org/10.3390/ijerph19159136

Pala, D.; Caldarone, A.A.; Franzini, M.; Malovini, A.; Larizza, C.; Casella, V.; Bellazzi, R. Deep Learning to Unveil Correlations between Urban Landscape and Population Health. *Sensors 2020, Volume 20, 2105*.

Pala, D.; Rocca, M. and Casella, V. (2019). Advantages and Difficulties of using Spatial Enablement to Support Public Health in Cities: The PULSE Case Study. In *Proceedings of the 5th International Conference on Geographical Information*

Systems Theory, Applications and Management - Volume 1: HGIS, ISBN 978-989-758-371-1, pages 322-329. DOI: 10.5220/0007900003220329

Pala, D; Holmes, J.; Pagàn, J.; Parimbelli, E.; Rocca, M.T.; Casella, V.; Bellazzi, R.: Agent-Based Models and Spatial Enablement: A Simulation Tool to Improve Health and Wellbeing in Big Cities. In: Riaño D., Wilk S., ten Teije A. (eds) Artificial Intelligence in Medicine. AIME 2019. Lecture Notes in Computer Science, vol 11526., pages 79-83, Springer, Cham

Pala, D.; Annovazzi-Lodi, L.; Bellazzi, R.; Fiscante, N.; Franzini, M.; Larizza, C.; Pogliaghi, A.; Raso, L.; Rocca, M. T.; Sapio, F.; and Casella, V.: THE KEY ROLE OF GEOGRAPHIC INFORMATION IN EXPOSOMICS: THE EXAMPLE OF THE H2020 PULSE PROJECT, *Int. Arch. Photogramm. Remote Sens. Spatial Inf. Sci*., XLIII-B4-2020, pages 283–289, https://doi.org/10.5194/isprs-archives-XLIII-B4-2020-283-2020, 2020.

Pala, D.; Zurlo, L.; Franzini, M.; Casella, V.; Bellazzi, R.; Vito,D. and larizza, C.: Preventive healthcare through air pollution exposure modeling: the example of PULSE in Pavia. Proceedings of the GNB 2020 conference, ISBN: 2724-2129.

Pala, D.; Parimbelli, E. ; Rocca, M.T. ; Bellazzi, R. ; Casella, V.; The PULSE Approach to Data Integration Enabling Spatial Analytics for Public Health in Cities. In *proceedings of the AMIA 2019 Informatics Summit, pages 865-866.*

Parimbelli, E.; **Pala, D.;** Bellazzi, R.; Vera-Munoz, C.; Casella, V.; Integrating Environmental Data, Citizen Science and Personalized Predictive Modeling to support Public Health in Cities: the PULSE WebGIS, *AAAI-18 W9 Workshop, New Orleans 2018*

Vitali, F.; Marini, S.; **Pala, D.**; Demartini, A.; Montoli, S.; Zambelli, A.; Bellazzi, R.: Patient similarity by joint matrix trifactorization to identify subgroups in acute myeloid leukemia, *JAMIA Open*, 2018, *Volume 1, Issue 1, Pages 75-86*

Bellazzi, R.; Caldarone, A.; **Pala, D.**; Franzini, M.; Malovini, A.; Larizza, C.; Casella, V: Transfer Learning for Urban Landscape Clustering and Correlation with Health Indexes. In: Pagán J., Mokhtari M., Aloulou H., Abdulrazak B., Cabrera M. (eds) *How AI Impacts Urban Living and Public Health. ICOST 2019.* Lecture Notes in Computer Science, vol 11862. Springer, Cham

C. Strusi, A. Dagliati, **D. Pala**, C. Larizza, R. Bellazzi and S. Quaglini, "Taking a walk avoiding polluted routes: an application to a virtual coach for cancer," *2022 IEEE 21st Mediterranean Electrotechnical Conference (MELECON)*, 2022, pp. 1107-1111, doi: 10.1109/MELECON53508.2022.9843091.

V. Uroŝević, A. Dagliati, M. Ottaviano, N. Vojičić, C. Larizza, **D. Pala**, " Design and Optimization of REST Services for Performance and Scalability in Provision of Big Environmental Data to Exploratory Analytics of their Effects on Progression of ALS and MS", *2022 IEEE 12th International Conference on Consumer Electronics (ICCE-Berlin)*

CONFERENCE PRESENTATIONS

"The PULSE Approach to Data Integration Enabling Spatial Analytics for Public Health in Cities." – American Medical Informatics Association (AMIA) Informatics Summit. San Francisco, CA March 2019.

"Agent-Based Models and Spatial Enablement: A Simulation Tool to Improve Health and Wellbeing in Big Cities." – Artificial Intelligence in Medicine (AIME) Conference. Poznan, Poland June 2019.

"Advantages and Difficulties of using Spatial Enablement to Support Public Health in Cities: The PULSE Case Study." – International Conference on Geographic Information System Theory. Heraklion, Greece May 2019.

"Transfer Learning for Urban Landscape Clustering and Correlation with Health Indexes." – International Conference on Smart Living and Public Health (ICOST), New York, NY October 2019.

"Preventive Healthcare through Air Pollution Exposure Modeling: the Example of PULSE in Pavia" – Conference of the Italian National Bioengineering Group, June 2021.

"Mediation Analysis and Mixed-Effects Models for the Identification of Stage-specific Imaging Genetics Patterns in Alzheimer's Disease" – IEEE BIBM 2022 Conference, Las Vegas, NV December 2022.

OTHER ACADEMIC EXPERIENCES

- Teaching assistant for the Biomedical Informatics Course at the Bioengineering faculty in Pavia, Italy (2019-2020 and 2020-2021)
- Thesis Advisor for four undergraduate students between 2018 and 2021
- Reviewer for conference papers
- Reviewer for the Journal of Biomedical Informatics (10 journal papers reviewed between 2019 and 2020)
- Invited Speaker at a NYU College of Global Public Health live interview about improving health in big cities in December 2018 (https://www.youtube.com/watch?v=gK8Ls3igqa0)
- Invited Speaker at the Center of Excellence in Environmental Toxicology at the University of Pennsylvania in April 2021.
- Program Committee member for the BIBM 2022 Conference
- Chair of the session "Cross-cutting Computational Methods and Bioinformatics of Disease" at the BIBM 2022 Conference.

Philadelphia, 11/12/2022