Mattia Zanon, PhD

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I am a data scientist with a demonstrated history of working in the medical device industry, focusing on medical wearables and digital health with applications to cardiovascular monitoring, diabetes and neurological diseases. I am a strong engineering professional with a strong track record of delivering innovative solutions to complex problems.

Professional Experience

- **F Hoffman-La Roche**, Basel, Switzerland
  - **Principal Scientist - pRED Data & Analytics**
    DEC 2022 - PRESENT
    - Co-driving from a data and science point of view the pivoting of Floodlight MS into an MS digital biomarkers clinical trial solution to expand the pRED value stream portfolio:
      - Engage with stakeholders from the clinical study team to understand their needs
      - Co-develop a data analyses plan for the development of digital endpoints endorsed by stakeholders.
    - Lead the data analysis team in pRED D&A working on FL MS Gen 2 and Gen 3, a digital tool to measure disease symptoms in people with Multiple Sclerosis:
      - Co-define scope and requirements for data analyses with team members, including proposing methodologies and success criteria. Act as a sparring partner to critically review the implementations and the results to guarantee the highest quality of the produced output
      - Methodologies used to analyse the data involved machine learning as well as statistical analyses for cross-sectional and longitudinal assessments of digital and clinical endpoints.
      - Data analyses lead for the Gaitlab study: study conceptualisation, team hiring, technical solution scoping, analyses. The collected dataset allowed to establish analytical validity for several digital measures in gait and balance from different smartphone wearing locations
      - Subject Matter Expert for signal processing of digital data collected by smartphones and smartwatches
      - Writing high-profile scientific publications to peer-review scientific journal and conferences.
      - Create IP to guarantee freedom to operate for the wider company in the digital health space
      - Connect, mentor and coach team members for fostering team-play and their development
      - Acting as data analyses SME for the team interacting with the FDA for the DeNovo pre-submission related to Floodlight Gen 2
      - Supported the development of a new data model for digital data leveraging CDISC standards used across the organisation for FAIRification of datasets
      - Organise a team of 15 colleagues of internal employees and additional contractors and consultants to create a work environment for sustainable productivity
      - Support the growth of the team by identifying knowledge and/or resources gaps and finding suitable consultant candidates via regular telephone and face-to-face interviews.
    - Member of the Floodlight Research & Medical squad:
      - Contribute to setting the strategic direction for the science in Floodlight
      - Convert the high level scientific direction into concrete data analyses activities
      - Interact with the product team to turn R&D activities into a commercial product
    - Contributions to scientific community:
      - Industrial supervisor of PhD projects as part of the EPSRC and MRC Systems Approaches to Biomedical Science CDT program of Oxford university. Student: Olivia Simpson
  - **Senior scientist - pRED Informatics**
    FEB 2019 - NOV 2022
    - Data product owner for the scientific aspects behind Floodlight Gen 1, a suite of tests implemented in a smartphone app measuring gait, cognition and hand motor function in people with Multiple Sclerosis. FL MS is a Class I/II SaMD and obtained MDR certification in the EU:
      - Responsabilities includes ownership of tests technical specifications and requirements, support for generating evidence for submission to regulatory authorities.
      - Execution of several (statistical) data analysis tasks to support the assessment developments and their validation as a SaMD
      - Conceptualization of robot experiments and performed data analyses to support the FL MS Gen 1 for analytical validity
      - Conceptualization of an internal experiment and performed data analyses to understand the feasibility of BYOD

    - Represent the digital biomarkers team in the Floodlight program ceremonies
    - Responsible for data transfers and data FAIRification activities. This included collection of requirements from stakeholders, and co-development of a semi-automatic system for generation of data transfer files and quality assurance checks to guarantee data integrity. This capability produced data transfers formally accepted by PDD processes, and has been leveraged by other disease areas in the value stream.
    - Support the growth of the team by identifying knowledge and/or resources gaps and finding suitable consultant candidates via regular telephone and face-to-face interviews.
    - Writing high-profile scientific publications to peer-review scientific journal and conferences.
  - Developed a novel signal processing pipeline based on wavelets for PPG signal analysis to calculate HRV metrics for measuring stress and anxiety in Autism Spectrum Disorder patients.

- **Biovotion (Now part of Biofourmis)**, Zurich, Switzerland

  - **Senior data scientist**
    DEC 2016 - JAN 2019
    - Conceptualised and developed a digital framework for characterising the influence of behaviour on health along different time scales using physiological and contextual data sources;
    - Developed software within agile methodologies in a medical regulated environment.

  - **Data scientist**
    SEP 2014 - NOV 2016
    - Developed and deployed algorithms for medical grade vital signs monitoring on the upper arm with PPG technology (pulse rate, SpO2, respiratory rate, energy expenditure);
    - Co-development of protocols for clinical trials used to collect data for vital signs validation and report creation for CE medical and FDA clearance submissions (The Everion device is listed as a Class II medical device -for heart rate measures- exempt from the 510(k) notification).

- **M31 (WearIT)**, Padova, Italy

  - **Data scientist**
    NOV 2014 - AUG 2015
    - Lead of analytics activities for a wearable smartwatch with a sport product-market fit. Including GPS and IMU sensors integration and application of supervised machine learning for gesture detection from inertial sensors. Used physiological models for non-invasive energy expenditure estimation in professional athletes for high performance sports.

- **National University of Ireland**, Maynooth, Ireland

  - **Post-doc researcher**
    JUL 2013 - AUG 2014
    - Research on the statistical properties of different methods to select informative inputs in regression and classification problems. Machine-learning and statistical analysis for business intelligence in industrial applications. (Partners: SeaGate Technology LLC., Trend Technologies Ltd. and Amgen).

- **University of Padova**, Padova, Italy

  - **Ph.D. in Information Technology**
    JAN 2010 - JAN 2013
    "Non-invasive continuous glucose monitoring: Identification of models for multi-sensor systems" http://goo.gl/l4DpBF.
    Algorithm development and application of machine learning tools for continuous physiological monitoring: Non-Invasive: Glucose and Stress (Partner: Biovotion AG,), EEG based drowsiness detection. Invasive: Improved accuracy of Intensive Care Unit device (GlucoClear) for glucose monitoring (Partner: DexCom Inc.)

  - **Research fellow**
    APR 2009 - DEC 2009 / FEB 2013 - JUN 201
    - Developed algorithms and models for non-invasive continuous glucose monitoring;
    - Improved the accuracy of glucose sensors and developed algorithms for drowsiness monitoring based on single channel EEG analysis.

Education

- Jan 2010-Dec 2012 — **Ph.D. in Information Technology** at the University of Padova, Italy
- Oct 2006-Mar 2009 — **M.Sc. (cum laude) in Bioengineering** at the University of Padova, Italy
- Oct 2003-Sep 2006 — **B.Sc. in Biomedical Engineering** at the University of Padova. Italy

Skills

- **Soft**
  Excellent written and spoken communicator, team work, self-starter, empathy, self-motivated.
- **Work methodologies**
  Hybrid scrum and kanban methodologies used to lead a data analysis team: agile ceremonies, ticketing system (JIRA), maintaining documentation (wiki), reproduce results and develop code with software versioning systems (GIT, SVN).
- **Software**
  Matlab, Python, R, C, SQL
- **Machine Learning**
  Supervised linear and non-linear regression and classification methods (Deep ANN including GAN architectures with tensorflow and keras, SVM, Regularization and Bayesian approaches to sparse problems, Kernels). Unsupervised data analysis methods (K-means, DBscan, HMM, t-sne). Familiar with common concepts of overfitting, datasets splits, model parameters tuning, etc.
- **Digital Signal Processing and System identification**
  On-line time series analysis (filter design, FFT, STFT, wavelets, prediction, ARIMA models, etc.).
- **Feature Extraction and selection**
  Univariate and multivariate tools (Spectral analysis, Chaos theory, PCA, ICA).
- **Statistics and data analysis**
  Methodologies for assessing psychometric properties of variables, including cross-sectional convergent validity (parametric and non-parametric) and test-retest reliability. Analyses of longitudinal data with linear models.
- **Data Visualisation**
  Principles of data visualisation and display of quantitative information according to E. Tufte work.

Additional information

- Co-Author of 13 scientific publications in peer-reviewed scientific journals (6 as first author) and 20 contributions to international engineering and medical conferences (see google scholar profile and mattiabl.github.io).
- Co-inventor of 10 patents.
- Chartered Engineer qualification obtained in 2012.

Languages

Italian: mother tongue English: fluent (C1) German: basic (A2)

Hobbies and Memberships

Ski and triathlon lover, espresso and pizza addict.
Active member of the Italian and Swiss Blood Donor Associations.

References provided on request.