

Igor **Matias**

PH.D. CANDIDATE · MASTER OF COMPUTER SCIENCE AND ENGINEERING

University of Geneva, Switzerland

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"Don't go through life, grow through life." - Eric Butterworth

Research Profile

Ph.D. Candidate in Information Systems at the University of Geneva, working at the intersection of digital health, machine learning, and longitudinal behavioral data. My research develops digital biomarkers of cognitive and affective functioning (brain health) using everyday technologies (wearable and smartphone data), through the Providemus alz project, with applications in early detection of brain health decline.

My work has already been published in venues such as *npj Digital Medicine*, *Statistics in Medicine*, and *JMIR AI*, and involves international collaborations across three continents. I have been invited to deliver several talks and organize workshops on digital health worldwide, and my work has received sustained visibility in the media, including television, press, and a personal feature in *National Geographic Portugal*.

Key Contributions

- Recipient of the 2026 Vontobel Prize for Research on Age(ing), by the UZH Healthy Longevity Center and the Vontobel Foundation
- Led a large-scale two-year longitudinal study combining wearable and cognitive data for brain health prediction
- First-author of two publications in *npj Digital Medicine* on passive digital biomarkers and Alzheimer's screening technology
- Led technology components in €2.9M+ international research funding (SNSF/THCS, Horizon Europe)
- Developed multi-timescale Machine Learning models for personalized prediction of cognitive trajectories

Selected Publications

PEER-REVIEWED JOURNAL ARTICLES

2026 **Digital biomarkers for brain health: passive and continuous assessment from wearable sensors**
Igor Matias, Maximilian Haas, Eric J. Daza, Matthias Kliegel, Katarzyna Wac
npj Digital Medicine

2026 **Passive Digital Health Technologies for Alzheimer's Disease Screening and Diagnosis A Systematic Review**
Igor Matias, Pawel Prociów, Eric J. Daza, Matthias Kliegel, Katarzyna Wac
npj Digital Medicine

2026 **AI-Powered Framework for Personalized Prescription of Physical Activity in Aging: Proposing PEPHA, a framework for Personalized Phenotyping for Aging**
Igor Matias, Melanie Mack, Matthias Kliegel, Katarzyna Wac
JMIR AI

2025 **Model-Twin Randomization (MoTR) for Estimating the Recurring Individual Treatment Effect**
Eric J. Daza, **Igor Matias**, Logan Schneider
Statistics in Medicine

Publications

Peer-reviewed journal articles

2026 **Use of AI within COA linguistic validation and eCOA migration processes: analysis and good practice recommendations**
Shawn McKown, Benjamin Arnold, Frederique Boucher, Helena Correia, Sonya Eremenco, Tomislav Gersic, Melinda Johnson, Andriana Koumbarou, **Igor Matias**, Emily Parks-Vernizzi, Tim Poepsel, Jiyoung Son, Erin Strouse, C. B. Terwee, Mark Wade
Journal of Patient-Reported Outcomes

2022 **What possibly affects nighttime heart rate? Conclusions from N-of-1 observational data**
Igor Matias, Eric J Daza, Katarzyna Wac
Digital Health

2021 **Prediction of Atrial Fibrillation using artificial intelligence on Electrocardiograms: A systematic review**
Igor Matias, Nuno Garcia, Sandeep Pirbhulal, Virginie Felizardo, Nuno Pombo, Henriques Zacarias, Miguel Sousa, Eftim Zdravevski
Computer Science Review

Conference proceedings articles

2025 **Daily Behavioral and Environmental Factors Association with Affective States and Quality of Life**
Maïssa Bouneb, **Igor Matias**, Katarzyna Wac
PervasiveHealth 2025

2025 **Use of personal mobile technologies for peer-based assessment of stress: a systematic literature review**
Antoine Bellanger, **Igor Matias**, Katarzyna Wac
EAI MobiCASE 2024

2024 **Providemus alz: Ubiquitous screening of Preclinical Alzheimer's Disease with consumer-grade Technologies**
Igor Matias, Matthias Kliegel, Katarzyna Wac
Companion of the ACM International Joint Conference on Pervasive and Ubiquitous Computing (UBICOMP)

2024 **You Are Not You When You Are Tired: The Effects of Ego Depletion on Stress Levels Reporting**
Antoine Bellanger, **Igor Matias**, Allan Berrocal, Katarzyna Wac
PervasiveHealth 2024

2024 **Modelling Users for User Modelling: Dynamic Personas for Improved Personalisation in Digital Behaviour Change**
Igor Matias, Farhat -ul-Ain, Darina Akhmetzyanova, Vladimir Tomberg
ACM Conference on User Modeling, Adaptation and Personalization (UMAP)

2024 **Behaviour Models-Enriched User Personas for Digital Behaviour Change Interventions**
Farhat -ul-Ain, Darina Akhmetzyanova, **Igor Matias**, Vladimir Tomberg
International Conference on PErvasive Technologies Related to Assistive Environments (PETRA)

2022 **Dejà vu: Recurrent Neural Networks for health wearables data forecast**
Igor Matias, Katarzyna Wac
IEEE International Conference on Machine Learning and Applications (ICMLA)

2022 **Behavioral Data Categorization for Transformers-based Models in Digital Health**
Clauirton Siebra, **Igor Matias**, Katarzyna Wac
IEEE International Conference on Biomedical and Health Informatics (BHI-BSN)

2018 **Scaffolding students on connecting STEM and interaction design: Case study in Tallinn University Summer School**
Igor Matias, Nuno Pombo, Nuno Garcia, David Lamas, Vladimir Tomberg
IEEE Global Engineering Education Conference (EDUCON)

2018 **Towards a Fully Automated Bracelet for Health Emergency Solution**
Igor Matias, Nuno Pombo, Nuno M Garcia
International Conference on Internet of Things, Big Data and Security (IoTBDS)

Preprints

2026 **Representation Matters in Longitudinal Affective Computing**
Igor Matias, Maximilian Haas, Eric J. Daza, Matthias Kliegel, Katarzyna Wac
arXiv

Thesis

2020 **ECG based Prediction Model for Cardiac-Related Diseases using Machine Learning Techniques**
Igor Matias
Universidade da Beira Interior

Conference posters

2026 **Brain Health in Everyday Life: Predicting and forecasting Cognitive and Affective changes from passive digital data**
Igor Matias, Matthias Kliegel, Katarzyna Wac
Geneva Aging Series XIV

2024 **Early detection of Alzheimer's disease using digital biomarkers: insights from the Providemus alz project**
Igor Matias, Matthias Kliegel, Katarzyna Wac
Biomarkers of Aging Conference

2024 **Assessing Cognitive Performance fluctuations using passive continuous Wearable Data**
Igor Matias, Matthias Kliegel, Katarzyna Wac
Geneva Aging Series XII

2024 **Providemus alz: Paving the way towards a ubiquitous and passive screening of Alzheimer's disease**
Igor Matias, Matthias Kliegel, Katarzyna Wac
Annual Conference of the Alzheimer's Disease International (ADI)

2022 **Physical Activity may affect Sleep unexpectedly. Results from small data**
Igor Matias, Eric J Daza, Alexandre De Masi, Katarzyna Wac
Annual Conference of the International Society for Quality of Life Research (ISOQOL)

2022 **Providemus alz: Giving you the power to foresee Alzheimer's disease effortlessly**
Igor Matias, Matthias Kliegel, Katarzyna Wac
Data Science Day of the University of Geneva

2022 **Fighting Alzheimer's Disease Effortlessly**
Igor Matias, Matthias Kliegel, Katarzyna Wac
Winter School of the Conférence Universitaire de Suisse Occidentale (CUSO)

Education

Université de Genève
Geneva, Switzerland

Ph.D. in Information Systems — *Jan. 2021 - Nov. 2026*

- Focusing on the development of digital biomarkers for cognitive performance fluctuations, with future brain disease early screening applications. Providemus alz project.

Universidade da Beira Interior
Covilhã, Portugal

M. Sc. in Computer Science and Engineering — *Sep. 2018 - Jul. 2020*

- With the resulting thesis titled "ECG based Prediction Model for Cardiac-Related Diseases using Machine Learning Techniques" graded with 19/20 in the final public defense with jury.

Universidade da Beira Interior
Covilhã, Portugal

B. Sc. in Computer Science and Engineering — *Sep. 2014 - Jul. 2018*

- With the final project titled "Intelligent Health Monitoring Bracelet" graded 18/20 in the public defense with a jury.

Awards

2026 **Vontobel Award for Research on Age(ing)**, UZH Healthy Longevity Center and Vontobel Foundation — *Switzerland*
2026 **Early Career Travel Award**, American Statistical Association — *USA*
2024 **Medal of Merit**, Municipality of Fundão — *Portugal*
2023 **Certificate of Appreciation**, IEEE Region 8 and IEEE Malta Section — *Malta*
2022 **Outstanding YP Member Award**, IEEE Portugal Section — *Portugal*
2017 **3rd place**, ICT ENTREPRENEUR Entrepreneurship Academy and Business Competition — *Cyprus*

Languages

Native Portuguese
C2 English
C1 French
B2 Spanish

Teaching Experience

Mobile Systems and Services
Geneva, Switzerland

Teaching assistant at the Universitè de Genève — *2024 - now*

- Teaching the steps from brainstorming until the final mobile prototype of a solution designed to solve a predefined daily-life problem. Guiding the students during the seminar classes.

Algorithmics and Data Management
Geneva, Switzerland

Teaching assistant at the Universitè de Genève — *2023 - now*

- Teaching algorithm fundamentals in Python.

Executive MBA - Business Analytics
Geneva, Switzerland

Teaching assistant at the Universitè de Genève — *2023*

- Executive Master of Business Administration. Teaching methods for the estimation of causality from intensive longitudinal data. Guiding the students on when, how, and why to get meaning from in-business collected data.

Services: from concept to market
Geneva, Switzerland

Teaching assistant at the Universitè de Genève — *2022 - now*

- Teaching the steps from brainstorming until the physical prototype of a solution designed to solve a predefined daily-life problem. Guiding the students during the seminar classes.

Advanced Database Development
Geneva, Switzerland

Teaching assistant at the Universitè de Genève — *2021 - 2023*

- Teaching about data cleaning, processing, and analyzing techniques applied to big datasets collected with connected devices. Guiding the students during the seminar classes.

Introduction to computer basics, Microsoft Office, and advanced networks
Cumura, Guinea-Bissau

Teacher at the Escola Unificada Dom Settimio Arturo Ferrazzetta — *2017-2019*

- Volunteer teaching of basic computer usage skills (beginner and intermediate level), introduction to Microsoft Office tools (beginner to advanced level), and advanced computer network management. Teaching school professors and technicians.

Summer School "Experimental Interaction Design"
Tallinn, Estonia

Teacher at the Tallinn University — *2016*

- Teaching about fast ways to prototype technology-based Ambient Assisted Living solutions. Guiding the students during a full week course on C coding, debugging, Arduino assembly, and soldering skills.

CodeWeek EU-UBI "Ignite Your Code"
Covilhã, Portugal

Teacher at the Universidade da Beira Interior — *2016*

- Teaching about project planning, prototyping, C coding, debugging, and Arduino assembly. Guiding the students during a half-day course on Arduino assembly and coding.

Research Funding and Grants

2026-29 **ENHANCE-CSVD: Early iNtervention for Brain Health And Mobility in Cerebral Small Vessel Diseases through Integrated Primary Care**
Total budget: €2,991,084; QoL Lab share: €477,369. | Grant ID: THCS2025-187 / SNSF-10TS1-_235536. Role: Contributed to the successful grant proposal; led the technology component. — *THCS | SNSF*

Workshops Organized

Pervasive Digital Health: The Road to Truly Personalized Healthcare
Potsdam, Germany

Hasso-Plattner Institute's Digital Health Innovation Forum 2025 — *Mar. 2025*

Navigating Digital Health Technologies: From Data Collection to Analysis
Cologne, Germany

ISOQOL Annual Conference 2024 — *Oct. 2024*

Introduction to Technology-Reported Outcomes for QoL research — *Calgary, Alberta, Canada*
ISOQOL Annual Conference 2023 — *Oct. 2023*

Open Data Repositories

Stress reports (patient and peer/proxy), application usage, touches buffered and user activity collected with a Smartphone — *CC BY 4.0*
https://doi.org/10/gt37w9 — *Jul. 2024*

Physical Activity, Heart Rate, and Sleep data collected with a Smartwatch (N=12) — *CC BY 4.0*
https://doi.org/10/gqzvpp — *Oct. 2022*

Open Source Code

PEPHA (Personalized Phenotyping for Aging) — *GPL v3*
https://gitlab.unige.ch/qol/pepha — *Sep. 2026*

Model-Twin Randomization 1st Python implementation — *GPL v3*
https://gitlab.unige.ch/qol/MoTR-python — *Aug. 2022*

Tutoring

Master's degree

2022-23 **Use of Personal Mobile Technologies for Peer-based Assessment of Stress**
Antoine Bellanger

Bachelor's degree

2024-25 **Daily Behavioral and Environmental Factors Association with Affective States and Quality of Life**
Maïssa Bouneb

Invited Talks and Scientific Presentations

From Everyday Digital Signals to Brain Health Forecasting: Lessons from the Providemus alz Study — *Düsseldorf, Germany*
University Hospital Düsseldorf, Neurology Department — *Oct. 2026*

What the body whispers: forecasting brain health trajectories from everyday smartwatch data — *Boston, USA*
Joint Statistical Meetings — *Aug. 2026*

What the body whispers: the future of brain health through everyday signals — *Lisbon, Portugal*
Medica AI 2026, Champalimaud Foundation — *Jul. 2026*

Passive physiological and environmental predictors of prospective memory: machine learning analysis of longitudinal data — *Heidelberg, Germany*
International Conference on Prospective Memory — *Jul. 2026*

From wearables to warnables: Rethinking mental health monitoring at scale — *Morges, Switzerland*
Geneva Aging Series XIII — *Sep. 2025*

Show me no more! Forecasting affective state and cognition using ubiquitous wearable technology — *Lausanne, Switzerland*
LIVES day — *Jun. 2025*

Light at the end of the copper wire: a tentative clarification of TechOs, TechROs, Digital COAs, and Digital Biomarkers — *Calgary, Alberta, Canada*
ISOQOL Annual Conference 2023 — *Oct. 2023*

Data overdose: side effects and metabolism of big data in the 21st century — *Oklahoma City, USA*
The University of Oklahoma Health Sciences Center's session "AI and Big Data in Healthcare" — *Feb. 2023*

Technology: your body's seismometer — *Geneva, Switzerland*
UNIGE's Data Science Day round table "Beyond SDGs: measuring and forecasting for taking action" — *Aug. 2021*

Co-calibrating Short Term, Mixed-Methods Based Momentary Assessments for Physical and Psychological Outcomes with Long Term Quality of Life Outcomes in Older Adults: An Evaluation of the coQoL Method — *Zurich, Switzerland*
Society for Ambulatory Assessment Conference — *Jul. 2021*

"Know You (Self) Better": N-of-1 Based Self-Examination Using Wearables And Self-Reported Behaviors For An Improved Well-Being — *Geneva, Switzerland*
Data Science Clinics — *Apr. 2021*

Media and Public Engagement

Jovens com Atitude: Igor Matias — *Portugal*
National Geographic Portugal — *Oct. 2026*

La montre connectée informe sur l'état de santé cérébrale — *Switzerland*
Je Journal de l'UNIGE — *Mar. 2026*

Estudo de cientista português usa IA para detetar de forma precoce declínio cognitivo — *Portugal*
SIC and SIC Notícias — *Jan. 2026*

O investigador fundanense que tenta antecipar-se à Alzheimer — *Portugal*
Jornal do Fundão — *Aug. 2024*

Detetar Alzheimer vinte anos antes dos primeiros sinais — *Portugal*
SIC and SIC Notícias — *Mar. 2024*

Inteligência artificial: "A moeda de duas faces" — *Portugal*
Farmacêutico News — *Nov. 2023*

O ChatGPT tomou de assalto a sociedade em quatro meses — *Portugal*
Newspaper SOL and Jornal i — *Apr. 2023*

General Public Talks

Quando o Corpo Fala Primeiro: Prever alterações cognitivas e emocionais com Inteligência Artificial e Tecnologia do Quotidiano — *Guarda, Portugal*
Closing event of the Iberian project "Horizontes Partilhados" — *Jul. 2025*

Inteligência Artificial e o Dia a Dia: No caminho para o pré-diagnóstico da doença de Alzheimer — *Rapoula, Portugal*
Feira da Saúde e Social — *May 2025*

Less pAIn more gAIn: LLMs and NLP to the rescue of a Ph.D. student — *Fribourg, Switzerland*
CUSO Psychology Ph.D. Students Days — *Nov. 2024*

TerapIA do futuro: o Psicólogo Omnipresente? — *Fundão, Portugal*
X Ciclo de Saúde Mental do Fundão — *Oct. 2024*

Spes Libertatis invited guest — *Portugal*
Mais Liberdade YouTube channel — *Feb. 2024*

Coding for a Cure: How AI is and will be unraveling the mysteries of Onco-Hematology — *Coimbra, Portugal*
HemeXChange by Takeda — *Jan. 2024*

Artificial Intelligence in the digital transition — *Matosinhos, Portugal*
Kick-off of the DIH 4 Global Automotive project — *Jan. 2024*

Development of Artificial Intelligence around the world: potential and challenges — *Porto, Portugal*
XVI National Congress of the Portuguese Association of Hospital Pharmacists — *Nov. 2023*

Digital Health: Health Technology and Artificial Intelligence — *Vitória, Espírito Santo, Brazil*
B-TECH Congress - III Congress of Technological Research in Business — *Nov. 2023*

O ChatGPT tomou de assalto a sociedade em quatro meses — *Guarda, Portugal*
Instituto Politécnico da Guarda — *May. 2023*

Experience

Universitè de Genève — *Geneva, Switzerland*
Teaching Assistant — *Jan. 2021 - now*

- Teaching B.Sc., M.Sc., and MBA courses. Assisting in research tasks within the QoL Lab and others.

Natura IMB Hotels — *Covilhã, Portugal*
Backend engineer and developer — *May. 2018 - Dec. 2020*

- Engineer and developer of an innovative indoor-person tracking solution applied to sports activities inside a sports hotel, working with mobile apps, RFID technology, and microsensors.

Human Subjects' Protocols Clearance

Assessing Cognitive Performance Fluctuations with Personal Technologies in Different Contexts of Daily Life: A Feasibility Study — *Switzerland and France*
Authorization by the Commission Cantonale d'Éthique de la Recherche (CCER), Switzerland — *2023*

- Protocol CCER 2023-00975

mQoL-Lab: Studying the Subjective and Objective Momentary as well as Longitudinal Perception of Quality of Life in Different Contexts of Daily Life — *Switzerland and European Union*

Authorization by Conseil d'Etat Geneve (art. 41 de la LIPAD) and accepted by the Ethics Review Board of the University of Geneva (CUREG), Switzerland — *2021*

- Protocol CUREG 2020-06-13

Certifications

Human Rights and the Artificial Intelligence — *Jul. 2023*
Global Digital Human Rights Network

Introduction to Quality of Life and Patient-Reported Outcomes — *Oct. 2022*
International Society for Quality of Life Research

Effective Grant Development and Writing — *Mar. 2022*
Conference universitaire de Suisse occidentale

Presentation Skills — *Mar. 2022*
Conference universitaire de Suisse occidentale

Legal aspects of research data — *Jan. 2022*
Universitè de Genève

Managing research data as a junior scientist — *Nov. 2021*
Universitè de Genève

Social and professional interaction in English — *Nov. 2021*
Conference universitaire de Suisse occidentale

English writing structure — *Oct. 2021*
Conference universitaire de Suisse occidentale

Media strategy for professional purposes — *Oct. 2021*
Universitè de Genève

Social networks, collaborative platforms and digital profiling — *Oct. 2021*
Universitè de Genève

Informed Consent — *Mar. 2021*
Training and Resources in Research Ethics Evaluation

Introduction to Research Ethics — *Mar. 2021*
Training and Resources in Research Ethics Evaluation

Research Ethics Evaluation — *Mar. 2021*
Training and Resources in Research Ethics Evaluation

Swiss National Supplement — *Mar. 2021*
Training and Resources in Research Ethics Evaluation

CCNA 1 Introduction to Networks CISCO — *Nov. 2017*
Cisco

English language - industrial relations — *Jan. 2016*
Instituto do Emprego e Formação Profissional

Extracurricular Activities

Membership Development Officer — *Portugal*
IEEE Portugal Section — *2024 - now*

- Enhancing engagement, retention, and showcasing the benefits of IEEE membership to the Portuguese section members.

Vice-Chair — *Europe, Middle East, and Africa*
IEEE Region 8 AdHoc Committee on Educational Infrastructure — *2023 - 2024*

Educational Activities Coordinator — *Portugal*
IEEE Portugal Section — *2022 - 2023*

- Leading the organization of a series of online seminars focusing on most of the fields of IEEE.

Corresponding Member
Europe, Middle East, and Africa

IEEE Region 8 Professional and Educational Activities Committee — *2022*

- Gave major contributions to the organization of a Region 8 Robot Championship and an engineering educational content promotion program, and on the reorganization of the committee website.

Professional and Educational Activities Coordinator
Portugal

IEEE Portugal Section — *2020 - 2021*

- Led the organization of a series of online seminars focusing on most of the fields of IEEE.

Volunteer
Guinea-Bissau

Projeto Querer e Fazer — *2017 - 2020*

- Project started in the 20th century and focused on humanitarian aid in several areas where health and education are a priority in countries of the African Continent.

Chief Technology Officer
Fundão, Portugal

STAR Junior Enterprise — *2020*

- The first Junior Enterprise in the Portuguese Center region countryside.

Software and Web Engineer
Beira Interior, Portugal

COVID-19 o que esta aberto? — *2020*

- Online free platform displaying a map with the establishments open during the pandemic in Portugal.

Chair
Covilhã, Portugal

IEEE Universidade da Beira Interior Student Branch — *2018 - 2019*

- Launched and chaired two international symposiums during this period.

Vice President
Covilhã, Portugal

Associação Academica da Universidade da Beira Interior — *2019*

- The most active Students Union in the Center countryside of Portugal.

Chair
Covilhã, Portugal

Google Developers Group Covilhã — *2018 - 2020*

- One of the first Google Developers Groups in Portugal.

Vice President
Covilhã, Portugal

Nucleo de Informatica da Universidade da Beira Interior — *2018*

- The oldest academic association of the Universidade da Beira Interior.

Volunteer Firefighter
Fundão, Portugal

Associação Humanitaria de Bombeiros Voluntarios do Fundão — *2010 - 2016*

- Reserve firefighter since 2017.

Membership

2016+	**IEEE**, Institute of Electrical and Electronics Engineers	*World*
2021+	**QoL Lab**, Quality of Life Technologies Lab	*Switzerland*
2024+	**LIVES**, Swiss Centre of Expertise in Life Course Research	*Switzerland*
2024+	**ACM**, Association for Computing Machinery	*World*
2024+	**SACAD**, Société Académique de Genève	*Switzerland*
2026+	**ASA**, American Statistical Association	*World*
2022-25	**ISOQOL**, International Society for Quality of Life Research	*World*
2017-20	**CIDB**, Centro de Investigação e Desenvolvimento da Beira	*Portugal*

Service

2026 **Article Reviewer**, Nature Digital Medicine
2025 **Article Reviewer**, ACM CHI
2024 **Abstract Reviewer**, ISOQOL
2024 **Publicity Chair**, IEEE MELECON
2023 **Article reviewer**, Journal of Alzheimer's Disease
2023 **Article reviewer**, IEEE ICMLA
2023 **Article reviewer**, IEEE BHI
2023 **Workshop and Symposium reviewer**, ISOQOL
2022 **Article reviewer**, IEEE BHI-BSN
2020 **Article reviewer**, IEEE Access
2019 **Chair**, "UBIsym on Robotics and Vehicular Technologies" IEEE international symposium
2018 **Chair**, "UBIsym in Healthcare Engineering" IEEE international symposium
2017 **Article reviewer**, IEEE EDUCON

Skills

Programming Assembly, C, Dart, JAVA, PHP, Python, SQL
Front-end CSS, HTML
Digital edition Blender, Illustrator, InDesign, LaTeX, Photoshop