

SANAZ NAZARI FARSANI

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I am a computational scientist with expertise in biomedical data analysis and statistical modeling. With a PhD focused on clinical trial data analysis and a 3-year postdoctoral fellowship at Stanford University, I offer a powerful fusion of advanced analytics, technical solutions, and hands-on research experience in the realm of pharmaceutical and health technology. I am passionate about delivering insights and innovative solutions to improve healthcare outcome.

Skills

- **Programming Languages:** Python, MATLAB, R, SAS, SPSS, Tableau
- **Project management:** Project Initiation, Planning, and execution, Leadership & Team Collaboration, Communication & Stakeholder Management, Risk Assessment & Mitigation, Agile Methodologies, Time & Resource Management, Analytical Problem-Solving, Continuous Improvement
- **Other Skills:** Coordinating Clinical Trials, Good Clinical Practice (GCP), Interim Analysis & reporting, Complex Data Formats Knowledge, Quality Control & Data Integrity, Attention to details, Strong Problem-Solving Abilities, Effective Organizational Skills, and Excellent Interpersonal Communication
- **Statistical Analysis:** Proficient in advanced statistical and machine learning techniques including hierarchical clustering, k-means clustering, general linear model (GLM), logistic regression, random forest modeling, t-test & Anova, Wilcoxon rank-sum test, principal component analysis (PCA), roc curve analysis, linear mixed-effects modeling, gaussian mixture models, and both parametric and non-parametric hypothesis testing, support vector machines (SVM), decision trees, data visualization (using tools such as matplotlib and seaborn), feature engineering, dimensionality reduction, cross-validation, model selection, and a/b testing.

Education

- **Doctor of Philosophy (Ph.D.):** Clinical Trial Data Analysis and Biostatistics, 09/2015-10/2020, **University of Turku, Finland**

In my PhD research, in a randomized double-blind placebo-controlled trial, I investigated the factors that can predict total hip arthroplasty (THA) outcome in postmenopausal women. Specifically, I explored the impact of an antiresorptive pharmaceutical therapy on femoral stem migration and periprosthetic bone loss after THA. I evaluated factors including baseline characteristics, bone mineral density (BMD), cortical bone thickness, surgery-related factors, and postoperative walking activity on the migration of the prosthetic component after THA. I also designed and built a phantom for the accuracy and precision evaluation of the model-based radiostereometric analysis (RSA) for the measurement of the implant migrations. Full dissertation [link](#).

Advisor: Prof. Hannu T. Aro, MD, Ph.D., University of Turku, and Turku University Hospital, hannu.aro@utu.fi

- **Master of Science (M.Sc.):** Biomedical Imaging, 09/2012-3/2014, **Åbo Akademi University, Turku, Finland**

In my master's thesis, I developed a model-based radiostereometric analysis system for evaluation of femoral stem's migrations after THA surgery.

Advisor: Dr. Niko Moritz, Ph.D., University of Turku, niko.moritz@utu.fi

Work Experience

- **Postdoctoral Research Fellow**, 04/2021 – 06/2024, **Stanford University**, CA, USA

As a computational scientist, I developed and evaluated cutting-edge machine learning and statistical modelling in medical data for:

- Synthetic data generation using generative adversarial neural network (GAN) and quality assessment using statistical data analysis
- Stroke prediction model on brain MR images followed by statistical evaluation including parametric and non-parametric hypothesis testing and Bland-Altman for visualization and evaluation of the results

Advisor: Prof. Craig Levin, Ph.D., Stanford University, cslevin@stanford.edu

- **Research Scientist**, 08/2017 - 03/2021, **Turku PET Centre**, Turku, Finland

Developed and implemented pattern recognition techniques to unravel imaging biomarkers for neurological conditions and classification in a large-scale imaging database.

- Data-driven technique for stroke lesion segmentation on multi-modal brain MR images
- Multi-voxel pattern analysis of the functional MR images (fMRI) to reveal the functional organization of social perception in the human brain
- ML and statistical modelling for decoding of the brain basis in natural scenes on fMRI images
- ML and statistical modelling for understanding the human emotions in the brain's auditory and motor cortex

Advisor: Prof. Lauri Nummenmaa, Ph.D., University of Turku, latanuu@utu.fi

- **Clinical Scientist**, 09/2015 - 07/2017, **Turku University Hospital**, Turku, Finland

I established statistical modeling for time-series analysis of the implant migration after total hip arthroplasty. More specifically I:

- Analyzed and visualized various clinical data to measure the micromotions of the implant after the surgery
- Developed a predictive model to detect the factors contributing to implant micromotions
- Reproducibility testing of the model-based RSA system using X-ray imaging
- Designed and built a physical phantom model of a hip arthroplasty implant to simulate implant migrations after the surgery and performed extensive modeling analysis of the phantom data

Advisor: Prof. Hannu T. Aro, MD, Ph.D., University of Turku, and Turku University Hospital, hannu.aro@utu.fi

Core Competencies

- Coordinated different aspects of a clinical trial including patient recruitment, randomization, follow-up, and protocol adherence.
- Successfully managed project timelines, budgets, and resources to ensure the seamless execution and completion of the study.
- Demonstrated expertise in collecting, managing, and analyzing clinical trial data using advanced measurement techniques and statistical software (e.g., SPSS, SAS, R).
- Effectively summarized and communicated complex research findings to both technical and clinical audiences through presentations, reports, and publications.
- Designed, executed, and oversaw multiple successful research projects in orthopedic surgery, neuroimaging, and molecular imaging, leading to significant advancements in these fields.
- Ensured strict compliance with ethical standards, patient consent, and confidentiality protocols throughout all research activities.
- Proficient in cross-functional team leadership, risk management, and quality assurance to maintain the highest standards of research integrity and patient safety.
- Developed collaboration among multidisciplinary teams, including clinicians, researchers, and data analysts, to drive project success and innovation.

Interests:

TED Talks, Hiking, Swimming, Yoga, Cooking