Arno Strouwen

Statistical Consultant

Curriculum Vitae
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Research Interest

How to design informative experiments for biological systems with noisy dynamics and incomplete knowledge of the model structure?

Research Experience

2022–current **Statistical Consultant**, Strouwen Statistics
- Scientific Computing consultancy in the Julia programming language.
- Focused on optimal data gathering strategies.

2025–Current **Senior Product Engineer**, PumasAI, Contract through Strouwen Statistics
- Development of software for noncompartmental analysis and bioequivalence.
- Contributing to the JuliaStats open-source organization.

2022–2025 **Research Scientist**, JuliaHub, Contract through Strouwen Statistics
- Made the **CI/CD** of https://docs.sciml.ai fully reproducible, ensuring that none of the examples in documentation can diverge.
- Successfully onboarded several leading pharmaceutical companies to the PumasQSP software.
- **Sensitivity analysis** of JuliaSimBatteries models to 4x reduce testing combinations.

2021–2022 **Postdoc Statistician**, The Janssen Pharmaceutical Companies of Johnson & Johnson
- **Model Based Design of Experiment**: designing **10x accelerated stability studies** to precisely predict the **shelf life** of pharmaceutical drugs and vaccines.
- **Probabilistic Programming**: Bayesian Non-linear **mixed effect modelling** of powder flowability.

2016–2021 **Ph.D. Fellow Strategic Basic Research**, Research Foundation Flanders
- **Optimal Experimental Design for Dynamic Systems:** Developing novel robust experimental design methodology for dynamic systems with both measurement and process noise.
- **Metabolism of Pear During Hypoxia**: Designing informative experiments to study respiration and fermentation characteristics of pear fruit.

Education

2022-2023 **Coursework Master of Statistics and Data Science**, UHasselt, Belgium
- **Deep Learning with Neural Networks**, Databases, Topological Data Analysis

2016–2021 **Ph.D. in Bio-science engineering**, KU Leuven, Belgium
- **Thesis:** "*Optimal Design of Dynamic Experiments in Bioscience Engineering*" under supervision of **Prof. Peter Goos** and **Prof. Bart Nicolaï**

2011–2016 **B.Sc.&M.Sc. in Bioscience-engineering**, *Bio-systems engineering*, magna cum laude, KU Leuven, Belgium
- **M.Sc. Thesis:** "*Towards a Coarse-Grained Model of the Acto-Myosin Cortex*"
- **B.Sc. Thesis:** "*Mechanical Properties of Joly red, Jonagold and Kanzi apples*"

Skills

Programming **Julia**, JMP; *Basic knowledge: Python, SQL, R, Matlab*

Statistics **Experimental Design**, Bayesian Statistics, Information Theory, Time Series Analysis, Regression, Generalized Linear Model, Ordinal Data, Anova, Blocked Experiment, Split-Plot experiment, Multivariate Statistics, Bayesian Filtering, Kalman Filtering, Uncertainty Quantification, Probabilistic Programming, Deep Learning, Neural Networks, Gaussian Processes, and Machine Learning

Mathematics **Dynamic Systems**, Differential Equations, Optimization, Control Theory, Interval Arithmetic, Differentiable Programming, and Scientific Computing

Peer Reviewed Publications

2025 **Experimental Design for Missing Physics.**
Arno Strouwen and Sebastian Micluța-Câmpeanu, *DYCOPS 2025*.

2023 **Adaptive and Robust Experimental Design for Linear Dynamical Models using Kalman filter.**
Arno Strouwen, Bart Nicolaï and Peter Goos, *Statistical Papers*, 64 (4).

2022 **Robust Dynamic Experiments for the Precise Estimation of Respiration and Fermentation Parameters of Fruit and Vegetables.**
Arno Strouwen, Bart Nicolaï and Peter Goos, *PLOS Computational Biology*, 18 (1).

2021 **D- and I-optimal design of multi-factor industrial experiments with ordinal outcomes.**
Karel Van Brantegem, Arno Strouwen and Peter Goos, C*hemometrics and Intelligent Laboratory Systems*, 221.

2019 **A Note on the Output of a Coordinate-Exchange Algorithm for Optimal Experimental Design**
Arno Strouwen and Peter Goos, *Chemometrics and Intelligent Laboratory Systems*, 192.

2019 **Optimizing Oxygen Input Profiles for Efficient Estimation of Michaelis-Menten Respiration Models.**
Arno Strouwen, Bart Nicolaï and Peter Goos, *Food and Bioprocess Technology*, 12 (5), 769-780.

Selected Invited Presentations

2025 **Small Sample Inference for Mixed Models.**
JuliaCon 2025

2025 **Experimental Design for Missing Physics.**
DYCOPS 2025, JuliaCon 2025 and Leuven Statistics Days 2025

2024 **Bayesian non-linear mixed effects model for safer powder storage.**
JuliaCon 2024, ENBIS-24, and NCS 2024

2023 **Optimal Design for Model Autocompletion.**
ENBIS-23

2023 **Adaptive and Robust Experimental Design for Linear Dynamical Models using Kalman filter.**
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2022 **Model Based Experimental Design for Accelerated Small Molecule Stability Studies**
NCS 2022

2019 **Bayesian Filtering Techniques for Optimal Experimental Design**
University of Southampton Seminar

2018 **Towards More Efficient Experimentation in Post Harvest Storage**
Marine Research Institute, Spanish Research Council (IIM-CSIC) Seminar

2018 **Optimizing an Oxygen Input profile to Estimate Michaelis-Menten Respiration Parameters**
ENBIS-18 Spring Meeting

2017 **Optimal Design of Experiments for Non-Linear Models using JMP**
KU Leuven Seminar

Teaching Experience

2023-2025 **Substitute for Professor Goos**, KU Leuven
Teaching the course Experimental Design in the Master of Statistics and Data Science

2022-2023 **Substitute for Professor Goos**, KU Leuven
Teaching the course Experimental Planning and Data Modelling in the Master of Science in Food Technology

2022 **Daily Supervisor for summer PhD intern**, Johnson & Johnson
Bayesian optimization for chemical reaction engineering

2017-2021 **Daily Supervisor for Bachelor/Master theses**, KU Leuven

- **Non-Linear Mixed Effect** Respiration and Fermentation Models using Pumas software
- Optimal Experimental Design Techniques for Michaelis-Menten Kinetics.
- Optimal Experimental Design Techniques for **Ordinal Data**.

2017-2019 **Teaching Assistant**, KU Leuven
Computer exercise classes for the course **Univariate Data and Modelling** in the **R programming language**