Nikolaos Ignatiadis - CV

CONTACT DETAILS

Stanford University
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`Google Scholar:` `user=KH3jpkoAAAAJ`

RESEARCH INTERESTS

I am interested in the development of interpretable statistical methods, accompanied by robust software implementations, for the analysis of datasets generated from modern, high-throughput technologies. From a statistical perspective, this interest encompasses multiple testing and Empirical Bayes inference in the presence of contextual side-information.

EDUCATION

Stanford University — Stanford, California, U.S.A.
Ph.D. in Statistics. (GPA 4.2+) — 09/2016 – present
Successful completion of qualifying exams.
Thesis Advisor: Stefan Wager

Heidelberg University — Heidelberg, Germany
- **M.Sc. Scientific Computing**, Grade 1.0 — 2015 - 2016
- **B.Sc. Mathematics**, Grade 1.0 with *distinction* — 2011 - 2015
- **B.Sc. Molecular Biotechnology**, Grade 1.0 — 2010 - 2013

The American College of Greece — Athens, Greece
Lykio with Apolytirio Eniaiou Lykiou — 2010
Valedictorian

PREPRINTS

1. Ignatiadis, N. and Huber, W. (2018). **Covariate powered cross-weighted multiple testing. arXiv preprint** arXiv:1701.05179.

PUBLICATIONS

2. Ignatiadis, N., Klaus, B., Zaugg, J. B. and Huber, W. (2016). **Data-driven hypothesis weighting increases detection power in genome-scale multiple testing. Nature methods**, 13(7), 577-580.
3. Beer, R., Herbst, K., Ignatiadis, N., Kats, I., *et al.* (2014). **Creating functional engineered variants of the single-module non-ribosomal peptide synthetase IndC by T domain exchange. Molecular BioSystems**, 10(7), 1709-1718.

TALKS AND PRESENTATIONS

1. **Workshop: Post-selection Inference and Multiple Testing** — February 2018
Institut de Mathématiques de Toulouse, France
Invited talk – Covariate-Powered Cross-Weighted Multiple Testing with FDR Control
2. **JuliaCon**, Berkeley (`http://www.youtube.com/watch?v=R8NEfWZAVmw`) — June 2017
Lightning talk – MultipleTesting.jl: Simultaneous Statistical Inference in Julia
3. **International Symposium on Synthetic Biology** — December 2013
German Cancer Research Center, Heidelberg, Germany
Presentation about Team Heidelberg's iGEM project

ONGOING PROJECTS

1. **Bias-Aware Confidence Intervals for Empirical Bayes Estimation** (with Stefan Wager)
We develop confidence intervals that provide asymptotic frequentist coverage of empirical Bayes estimands. Our intervals include an honest assessment of bias even in situations where empirical Bayes point estimates may converge very slowly.
2. **Covariate-powered Empirical Bayes shrinkage** (with Stefan Wager)
Empirical Bayes methods provide a practical way of improving point estimates by sharing information across units; say genes in a genomics experiment or multiple A/B tests. Here we develop practical methods for shrinkage estimation in situations with strong prior heterogeneity which can be explained using auxiliary covariates, such as the location of each gene or the type of each product being advertised.

3. **Estimation of sparse transition matrices** (with Sylvia Plevritis and Robert Tibshirani)
   We develop methods using L_1 penalization for estimating transition matrices of discrete Markov models, when the number of states is large relative to the number of time points and observations. Furthermore, we extend our methods to deal with aggregate, incomplete data schemes and apply them to single cell data of the epithelial-mesenchymal transition, a key process which enables the metastasis of cancer cells.

Teaching

Teaching Assistant (TA) at Stanford

STATS 300A: Theory of Statistics I.	Fall 2018
STATS 366 (BIOS 221): Modern Statistics for Modern Biology.	Summer 2017 & 2018
STATS 218: Introduction to Stochastic Processes II.	Spring 2018
STATS 290: Computing for Data Science.	Winter 2018
STATS 305A: Introduction to Statistical Modeling.	Fall 2017
STATS 191: Introduction to Applied Statistics.	Winter 2017
STATS 141 (BIOS 141): Biostatistics.	Fall 2016

Trainer

Introductory Course: Statistical Bioinformatics using R and Bioconductor — October 2015
EMBL (European Molecular Biology Laboratory), Heidelberg, Germany

Professional Service

Invited peer review
Bioinformatics, PeerJ (`https://publons.com/author/1470395`)

Scholarships

Deutschlandstipendium 2011-2013
A scholarship for talented and high-achieving students at public and state recognised institutions of higher education in Germany supported by the German Federal Government.

Awards and Honors

Departmental Teaching Assistant Award, Statistics Department, Stanford — June 2018

Grand Prize Winner & Best Foundational Advance in the **iGEM** — November 2013
(international Genetically Engineered Machine) competition with Team Heidelberg, MIT.

Bronze medal in the International Biology Olympiad (**IBO**), Changwon, South Korea. July 2010

Rank 3 in the 6th National Biology Competition, Greece. May 2010

Rank 8 in the 8th European Competition of the Ancient Greek language. June 2009

Languages

English (Fluent), **German** (Native), **Greek** (Native)

Programming Languages

R, **Julia**, Python, C

Open-Source Software

IHW (`http://bioconductor.org/packages/IHW`)
A R/Bioconductor package implementing the Independent Hypothesis Weighting method.
IHWpaper (`http://bioconductor.org/packages/devel/data/experiment/html/IHWpaper.html`)
A package reproducing all analyses for the Independent Hypothesis Weighting publications.
SmoothingSplines.jl (`https://github.com/nignatiadis/SmoothingSplines.jl`)
A statistical package for nonparametric regression via Smoothing Splines in Julia.