Bianca Dumitrascu

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EDUCATION

Ph.D. Quantitative and Computational Biology, Princeton University, 2019

M.S. Quantitative and Computational Biology, Princeton University, 2015

B.S. Mathematics, Massachusetts Institute of Technology, 2013

ACADEMIC APPOINTMENTS

2020– **Institute for Advanced Study**
Member, School of Mathematics
Special Year on Optimization, Statistics, and Theoretical Machine Learning

2019–20 **Duke University**
Postdoctoral Fellow, Department of Statistics
Visiting Fellow, Statistical and Applied Mathematical Sciences Institute
Special Semester on Deep Learning

RESEARCH AREAS

I develop interpretable statistical methods, employing techniques from *Bayesian statistics*, *active learning*, *transfer learning*, and *deep generative models*, with the broader goal of quantifying the impact of genetic variation on biological traits. I work with *high-dimensional genomic data* such as single-cell RNA-seq to understand how local rules can impact global behaviors as illustrated by cell type micro-environment organisation within tissues.

PUBLICATIONS

***indicates co-first authors**

Peer-Reviewed Journal Articles and Conference Papers

Li-Fang Cheng, **Bianca Dumitrascu**, Michael Zhang, Corey Chivers, Michael Draugelis, Kai Li, Barbara E. Engelhardt
Patient-Specific Effects of Medication Using Latent Force Models with Gaussian Processes.
International Conference on Artificial Intelligence and Statistics (AISTATS), 2020

Rebecca Elyanow, **Bianca Dumitrascu**, Barbara E. Engelhardt, Benjamin J. Raphael
netNMF-sc: leveraging gene–gene interactions for imputation and dimensionality reduction in single-cell expression analysis
Genome Research 30: 195-20, 2020

Gregory Gundersen, **Bianca Dumitrascu**, Jordan T. Ash, Barbara E. Engelhardt
End-to-end training of deep probabilistic CCA for joint modeling of paired biomedical observations
International Conference on Uncertainty in Artificial Intelligence (UAI), 2019

Derek C. Aguiar, Li-Fang Cheng, **Bianca Dumitrascu**, Francine Modelet, Athma Pai, Barbara E. Engelhardt
Bayesian nonparametric discovery of isoforms and individual specific quantification
Nature Communications 9(1),1681.4, 2018

Bianca Dumitrascu, Gregory Darnell, Julien Ayroles, Barbara E. Engelhardt
Statistical tests for detecting variance effects in quantitative trait studies.
Bioinformatics 35(2),200–210, 2018

Bianca Dumitrascu*, Karen Feng*, Barbara E. Engelhardt
PG-TS:Improved Thompson Sampling for Logistic Contextual Bandits
Advances in Neural Information and Processing Systems (NeurIPS), 2018

Preprints

Federico Camerlenghi*, **Bianca Dumitrascu***, Federico Ferrari*, Barbara E. Engelhardt, Stefano Favaro
Nonparametric Bayesian multi-armed bandits for single cell experiment design
arXiv preprint arXiv:1910.05355, 2019

Michael Minyi Zhang, **Bianca Dumitrascu**, Sinead A. Williamson, Barbara E. Engelhardt
Sequential Gaussian Processes for Online Learning of Nonstationary Functions
arXiv preprint arXiv:1905.10003, 2019

Bianca Dumitrascu*, Soledad Villar*, Dustin G. Mixon, Barbara E. Engelhardt
Optimal gene selection for cell type discrimination in single cell analyses
bioRxiv preprint 599654, 2019

Jonathan Lu*, **Bianca Dumitrascu***, Ian C McDowell, Brian Jo, Alejandro Barrera, Linda K. Hong, Sarah M. Leichter, Timothy E. Reddy, Barbara E. Engelhardt
Causal Network Inference from Gene Transcriptional Time Series Response to Glucocorticoids
bioRxiv preprint 587170, 2019

Bianca Dumitrascu*, Karen Feng*, Barbara E. Engelhardt
GT-TS: Experimental design for maximizing cell type discovery in single-cell data
bioRxiv preprint 386540, 2019

Li-Fang Cheng, Gregory Darnell, **Bianca Dumitrascu**, Corey Chivers, Michael E. Draugelis, Kai Li, Barbara E. Engelhardt.
Sparse multi-output Gaussian processes for medical time series prediction
arXiv preprint arXiv:1703.09112, 2017

INVITED TALKS AND EXTENDED ABSTRACTS

Bandits and Experimental Design
Models, Inference, and Algorithms, Broad Institute of MIT and Harvard, 2018
Invited Talk

Mixed Bivariate Logistic Copulas for Depression Risk Factor Identification
International Society for Bayesian Analysis, Edinburgh, 2018
Poster Presentation

A Bayesian nonparametric factor analysis model for gene co-expression under structured and unstructured noise
Women in Machine Learning Workshop, Barcelona, 2016
Poster Presentation

Exploring the Glucocorticoid receptor network - challenges in causal inference
Probabilistic Modeling in Genomics, Oxford University, 2016
Invited Talk

Detection of variance controlling quantitative traits loci New York Area Population Genomics Workshop, NYC, 2015 *Oral Presentation*

BTH: A Bayesian test to identify variance quantitative trait loci
American Human Genetics Society Annual Meeting, Baltimore, MD, 2015
Poster Presentation

TEACHING EXPERIENCE

Princeton University

2015 Introduction to Java Programming (ISC231 - COS126), Assistant in Instruction

2015 Interacting with Data (COS 424), Assistant in Instruction

2014 Research Topics in Quantitative and Computational Biology (QCB 302), Assistant in Instruction

MENTORSHIP

Undergraduate Student Independent Research Advising

Karen Feng (Princeton University; currently at Databricks)

Jonathan Lu (Princeton University; currently at Stanford Medical School)

ACADEMIC SERVICE

Journal Peer Review: Journal of Machine Learning Research, Bioinformatics

Conference Peer Review: Annual International Conference on Neural Information Processing Systems (NIPS), International Conference on Artificial Intelligence and Statistics (AISTATS), International Conference on Uncertainty in Artificial Intelligence (UAI), International Conference on Intelligent Systems for Molecular Biology (ISMB)

Conference Organization: Topics in Missing Data Workshop (IAS Special Year in Optimization, Statistics, and Theoretical Machine Learning, 2020)

Seminar Organization: Princeton Computer Science and Machine Learning Reading Group, 2014–2016

PROFESSIONAL AFFILIATIONS

The International Society for Bayesian Analysis

PROFESSIONAL EXPERIENCE

2017 Google Inc. Research Intern (video recommendation, embeddings)

TECHNICAL SKILLS

Coding skills: Python, R, Matlab, LaTeX, standard Unix tools.

Updated May 2020