Annachiara Korchmaros

Leipzig, Germany
✉ *annachiara@bioinf.uni-leipzig.de*
🏠 *http://akorchmaros.com/*

Research Experience

June 2021 - present
Career break for maternity leave

Universität Leipzig - Leipzig, Germany
Postdoctoral Researcher
Bioinformatics Leipzig
○ Studying best match graphs, their generalizations, and applications to bioinformatics

December 2019 - May 2021

Aalto University - Espoo, Finland
Postdoctoral Researcher
Department of Mathematics and Systems Analysis
○ Studied the structure of 2-colored best match graphs
○ Estimated neuronal manifold dimension
○ Reconstructed 3D DNA structure of diploid organisms
○ Studied phylogenetics networks

August 2018 - August 2019

Child Mind Institute - New York, US
Data Analyst
Center for the Developing Brain
○ Studied how to improve the reliability of fMRIs
○ Investigated the impact of functional alignment on the reliability of fMRIs
○ Manually cleaned brain image databases
○ Explored new strategies to improve current software packages
○ Biweekly presented research findings to other teams

Dec - May 2017

Georgia Institute of Technology - Atlanta, US
School of Biology, Giboson Lab
○ Implemented a linear regression model to estimate the average cell-type specific gene expressions in blood given cell counts and total gene expressions
○ Analyzed and cleaned microarray datasets from different platforms

February - April 2016

Georgia Institute of Technology - Atlanta, US
School of Biology, Lachance Lab
○ Managed human genome datasets of admixed individuals
○ Studied risk scores with MATLAB

Teaching Experience

August 2015 - May 2017

Georgia Institute of Technology - Atlanta, US
Graduate Teaching Assistant
School of Mathematics
○ Simplified mathematical concepts for one-on-one tutoring
○ Assisted students during small-group learning periods
○ Planed and executed lessons for up to 60 students
○ Graded all assignments and exams

Education

May 2017

Georgia Institute of Technology, Atlanta, GA
M.S. in Bioinformatics
Overall GPA - 3.91

February 2015	**University of Basilicata, International Doctoral Seminar JÁNOS BOLYAI, Potenza, Italy**
	Ph.D. in Mathematics
	110/110 Cum Laude
	Thesis: Permutations and Sorting Problems
	Associated Institutes: University of Campania, University of Perugia, University of Szeged
September 2011	**University of Perugia, Perugia, Italy**
	M.S. in Mathematics
	110/110 Cum Laude
	Thesis: Alignments of DNA Sequences Studied within Tropical Mathematics
February 2009	**University of Perugia, Perugia, Italy**
	B.S. in Mathematics
	110/110 Cum Laude
	Thesis: An Introduction to Algebraic Curves
	Languages
	English: Second Language
	Italian: Native fluency

Conferences and Seminars

January 2020	**Algebra and Discrete Mathematics Seminar**
	Department of Mathematics and Systems Analysis of Aalto University
	Guest Speaker
	"Colored Best Match Graphs"
May 2015	**Georgia Tech Combinatorics Seminars**
	Department of Mathematics of Georgia Institute of Technology
	Guest Speaker
	"Combinatorial Properties of Block Transpositions in Symmetric Groups"
June 2014	**Combinatorics 2014**
	Italian Institute of Mathematics (IndaM)
	Guest Speaker
	"Block transposition diameter of the symmetric group"
March 2014	**45th Southeastern International Conference on Combinatorics, Graph Theory and Computing (SEICCGTC)**
	National Security Agency and Institute of Combinatorics and its Applications
	Guest Speaker
	"On the block transposition diameter of permutations"

Posters and Publications

1. **A. Korchmaros; D. Schaller, M. Hellmuth; P. F. Stadler**
   Quasi-Best Match Graphs
   arXiv doi:2109.10235 (2021)

2. **A. Korchmaros**
   The structure of 2-colored best match graphs. Discrete Appl. Math. 304 (2021), 397-416

3. **X. Wang; X. Li; J. Cho; B. Russ; N. Rajamani; A. Omelchenko; L. Ai; A. Korchmaros; P. Garcia-Saldivar;Z. Wang; N. Kalin; C. Schroeder; C. Craddock; A. Fox; A. Evans; A. Messinger; M. Milham; T. Xu**
   U-Net Model for Brain Extraction on Non-human Primates
   bioRxiv, in press (2020)

4. **J. Cho; A. Korchmaros; J. Vogelstein; M. Milham; T. Xu**
   Impact of concatenating fMRI data on reliability for functional connectomics
   NeuroImage, in press (2020)

5 **J. Cho; A. Korchmaros; J. Vogelstein; M. Milham; T. Xu**
Developing a gradient flow framework to guide the optimization of reliability for the study of individual differences
Poster presented at: Organization of Human Brain Mapping 2020; June 2020; Virtual Conference

6 **A. Korchmaros**
Circles and Paths in 2-Colored Best Match Graphs
arXiv doi:2006.04100 (2020)

7 **A. Korchmaros; J. Cho; A. Heinsfeld; J. Haxby; M. Milham; T. Xu**
Beyond the test-retest reliability: the impact of the intra- and inter-individual variation
Poster presented at: Organization of Human Brain Mapping 2019; June 2019; Rome, Italy

8 **A. Korchmaros; I. Kovacs**
Automorphism groups of Cayley graphs generated by block transpositions and regular Cayley maps
Discrete Math. 340 (2017), 3125–3139

9 **C. Bocci; A. Korchmaros**
Tropical properties of alignment matrices
Adv. Appl. Discrete Math. 11 (2013), no. 1, 23–46

Organization

August 2021 **M. Panizzut; L. Lamberti**
Minisymposium on Algebraic Geometry of Biomedical Data
SIAM Conference on Applied Algebraic Geometry

Skills

Programming Languages
MATLAB, R, Python, Julia, and Shell scripting

Software
FSL, Git, Macualay2, Magma, and JMP