Nicholas Attila Kovacs

Bioinformaticist & Data Scientist

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Expertise

- Computational biologist aspiring to be a biopharmaceutical consultant and scientific diplomat
  - Presented research as oral and poster presentations at conferences in Tokyo, Central Vietnam, and US
  - Independently wrote and awarded NSF grant to conduct summer research in Taipei, Taiwan
  - Two 1st-author scientific publications with 3rd in preparation
  - Coauthor of 7 scientific publications
  - Managed 8 senior undergraduates per semester for 6 semesters as a teaching assistant for a biophysical chemistry lab course

Education

Ph.D. Bioinformatics GPA: 3.5 — *Aug 2013 - Dec 2018*
Georgia Institute of Technology — *Atlanta, GA*

B.S. Biochemistry and Molecular Biology/Biotechnology GPA: 3.3 — *Aug 2008 - May 2012*
Michigan State University — *East Lansing, MI*

Experience

Graduate Research Assistant — *Aug 2013 - Current*
Georgia Institute of Technology — *Atlanta, GA*

Dissertation: *Data Mining the Atomic Structure of the Ribosome to Unravel the History of Protein Folding*

- **Summary**: Applied structural bioinformatics and machine learning algorithms to atomic coordinate datasets from over 100 biomolecules composed of 150,000-200,000 atoms to unravel the interralatedness and diversification of life.
- **Results**: Two 1st-author research articles published. 3rd in preparation.
- **Collaboration**: Coauthored 2 experimental and 4 computational research articles.
- **Communication**: Independently wrote and awarded $7,000 NSF grant to support summer research in Taiwan. Oral and poster presentations at 7 domestic and international scientific conferences.
- **Mentoring**: Awarded $2,500 conference and travel funding for mentoring undergraduate student.
- **Courses**: 9 courses in biochemisty, computational biology, statistics, and computer science. Concept-to-Market business short-course completed.

Atomic Interaction Network Analysis of the Ribosome — *Fall 2017*
Course Project for CS 7280 - Network Science — *Atlanta, GA*

- Collaborated with a team member to apply course concepts and algorithms to 3 atomic interaction networks of the biomolecule, the ribosome, each composed of more than 100,000 edges between approx. 50,000 nodes.
- **Results**: Predicted RNA and protein folding domains within the ribosome by applying community detection algorithms.

Graduate Teaching Assistant — *Aug 2013 - Dec 2016*
Georgia Institute of Technology — *Atlanta, GA*

- **Biophysical Chemistry Lab(CHEM 4582)** - 6 semesters - Instructed ~8 undergraduate students on experimental and computational protocols.
- **Macromolecular Structure(CHEM 6572)** - 2 semesters - Directed ~25 graduate students on the use of computational modelling programs.
- **Survey of Biochemistry(CHEM 3511)** - 1 semester - Guided ~40 undergraduate students to solve homework problems in weekly recitation.

Analysis and Interpretation of NGS Data from CDC — *Aug 2014 - May 2015*
Course Project for BIOL 8803B - Programming for Bioinformatics and BIOL 7210 - Computational Genomics — *Atlanta, GA*

- Worked in multidisciplinary teams of biologists and computer scientists to identify pathogens from DNA sequences provided by the CDC.
- Analyzed 97 NGS single-end and paired-end reads of *Neisseria meningitidis*, *Haempophilus influenza*, and *Haemophuilus haemolyticus* generated from GAII or Illumina HiSeq/MiSeq instruments.
- **Results**: Developed a typing-tool that identifies the organism and its serotype/serogroup from DNA sequence file inputs and constructed a genome browser of 53 annotated genomes to view annotated genomes.

Skills

Programming	Python, Perl, Bash, SQL, R, MATLAB, Javascript, HTML, CSS
Python Packages	Numpy, Pandas, Scipy, SK-Learn, Matplotlib, Seaborn, Plotly, NetworkX, igraph, Biopython, Jupyter, PySpark
Machine Learning	Linear Regression, Logistic Regression, SVM, Decision Trees, Random Forest, KNN, K-Means, PCA, Community Detection
Structural Bioinformatics	PyMOL, Maestro, PyRosetta, VMD, NAMD, AutoDock, MODELLER
Computational Genomics	*de Novo* Genome Assembly, SAMtools, BCFtools, VCFtools, bwa, GATK, JBrowse
OS and Software	Ubuntu, RHEL, Windows, OSX, Amazon Web Services, Microsoft Office, Adobe Illustrator, Cytoscape, Tableau, Git