

Tomáš Brůna

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RESEARCH EXPERIENCE

Georgia Institute of Technology Graduate Research Assistant

Atlanta, GA
2019 – present

- Developing algorithms for gene prediction in novel eukaryotic genomes.
- Lead developer of BRAKER2 [1] and GeneMark-EP+ [2], state-of-the-art gene prediction algorithms used by researchers across the world.
- Designing algorithms for the analysis of the novel long-read RNA-Seq data.
- Working with genomic, transcriptomic, and proteomic data from a diverse set of organisms, including fungal, animal, and plant genomes.
- Working with a wide range of the latest bioinformatics tools, actively participating in the testing and development of some of them [3].

Czech Technical University in Prague Data Scientist

Czech Republic
2014

- Researched unsupervised machine learning methods with a focus on advanced clustering algorithms.
- Developed Chameleon 2 [5], a novel graph-based clustering algorithm, capable of finding clusters in complex graphs with minimal parameter tuning.

WORK EXPERIENCE

Philips Advanced Bioinformatics Research Intern

Cambridge, MA
2018

- Designed an integrative genomics pipeline for DNA and RNA variant analysis, resulting in a comprehensive suite for variant finding and their functional evaluation based on the allele-specific expression status.
- Implemented this pipeline on a highly scalable cloud-based platform where it is used by clinicians and genomics researchers to identify putative disease-related variants.
- Worked with and analyzed human genomics and transcriptomics data, leveraging information from large public databases such as the Cancer Genome Atlas.

Charles University in Prague Software Developer

Czech Republic
2014

- Designed and developed an on-line system for classroom reservations at the First Faculty of Medicine of Charles University.
- Actively maintaining and improving the software, which is still being used by this university.

EDUCATION

Georgia Institute of Technology Ph.D., Bioinformatics

Atlanta, GA
2019 – present

- GPA: 4.0

Georgia Institute of Technology M.Sc., Bioinformatics

Atlanta, GA
2017 – 2018

- Holder of Naumann-Etienne Foundation Scholarship – full-ride scholarship for Master's program at Georgia Tech.
- GPA: 4.0

Czech Technical University in Prague, Faculty of Information Technology Milwaukee School of Engineering B.Sc., Software Engineering

Czech Republic
Milwaukee, WI
2012 – 2016

- Graduated with Honors
- Received the Dean's Award for an exceptional bachelor's thesis
- Spent one year as an exchange student at Milwaukee School of Engineering
- GPA: 3.77

**SELECT
PUBLICATIONS**

JOURNALS

- [1] Brůna, T., Hoff, K. J., Lomsadze, A., Stanke, M., & Borodovsky, M., “BRAKER2: Automatic eukaryotic genome annotation with GeneMark-EP+ and AUGUSTUS supported by a protein database”, *NAR Genomics and Bioinformatics*, 3(1), lqaa108, Jan 2021.
- [2] Brůna, T., Lomsadze, A., & Borodovsky, M., “GeneMark-EP+: eukaryotic gene prediction with self-training in the space of genes and proteins”, *NAR Genomics and Bioinformatics*, 2(2), lqaa026, May 2020.
- [3] Gabriel, L., Hoff, K. J., Brůna, T., Borodovsky, M., & Stanke, M. “TSEBRA: Transcript Selector for BRAKER”, *bioRxiv*, Jun 2021.
- [4] El-Sayed, W. M., Gombolay, A. L., Xu, P., Yang, T., ..., Brůna, T., ..., & Storici, F., “Disproportionate presence of adenosine in mitochondrial and chloroplast DNA of *Chlamydomonas reinhardtii*”, *Iscience*, 24(1), 102005, Jan 2021.
- [5] Barton, T., Brůna, T., & Kordik, P., “Chameleon 2: An Improved Graph-Based Clustering Algorithm”, *ACM Transactions on Knowledge Discovery from Data (TKDD)*, 13(1), 1-27, Jan 2019.

CONFERENCES

- [6] Brůna, T., Lomsadze, A., & Borodovsky, M., “Improving Methods of Automatic Annotation of Plant Genomes” in *Plant and Animal Genome XXVIII Conference (PAG)*, Jan 2020.
- [7] Barton, T., Brůna, T., & Kordik, P., “MoCham: Robust hierarchical clustering based on multi-objective optimization” in *2016 IEEE 16th International Conference on Data Mining Workshops (ICDMW)*, pp. 831-838, Dec 2016.

**ACADEMIC
AWARDS**

- Holder of Naumann-Etienne Foundation Scholarship – full ride scholarship for Master’s program at Georgia Tech. 2017 – 2018
- Honors List, Fall 2015, Winter and Spring 2016, Milwaukee School of Engineering 2015, 2016
- 16th place in the ACM Programming Contest in USA’s North Central region 2015
- Dean’s Award for an exceptional bachelor’s thesis, Czech Technical University 2015

LANGUAGES

- English: Fluent – IELTS score 8.0, equivalent to C2 level
- Czech: Native language
- German: Elementary

SKILLS

Machine Learning, Data Analysis, Computational Genomics, Cluster Analysis, C++, Software Development, R, Java, Python, Perl, Bash, L^AT_EX, CUDA, Cluster Computing, MapReduce, Spark, SQL, Amazon AWS, Microsoft Azure