Burak Himmetoglu

Serimmune Inc.
150 Castillian Dr., Suite 100
burak@serimmune.com

PROFILE

Data scientist with a computational/theoretical physics background.

Expertise in applied mathematics (10+ years), numerical analysis (+10 years), statistics (10+ years), scientific computing (10+ years) and machine learning (3 years).

Expertise in high performance and cloud computing (5+ years).

Expertise in various programming languages and parallel/distributed data processing schemes (5+ years).

EXPERIENCE

Data Scientist, Serimmune 2017 - Present

Built computational frameworks for analyzing peptide sequence data to discover disease specific sequence patterns/motifs.

Built machine learning and feature selection frameworks for analyzing high-dimensional datasets.

Built de Bruijn graph based networks for unveiling hidden patterns/structures in various oncology, infectious and autoimmune disease datasets.

Collaborated with laboratory scientists to develop data products and visualizations.

High Performance Computing Consultant, University of California Santa Barbara 2015-2017

Collaborated with research scientists and faculty to provide solutions to computationally demanding problems using high performance and cloud computing environments.

Trained researchers in high performance and scientific computing, taught classes in Python, R and Matlab.

Developed the RoboBohr package, a machine learning based electronic structure prediction framework for chemical discovery (https:// github.com/bhimmetoglu/RoboBohr).

Developed applications of deep learning in time-series medical data.

Post doctoral researcher, University of California Santa Barbara 2013-2015
Conducted research in computational physics and materials science.

Developed methods and algorithms for predicting properties of semi-conductor systems at the quantum mechanical level.

Post doctoral researcher, University of Minnesota 2010-2013
Conducted research in computational physics and materials science.

Developed algorithms for numerical simulations of quantum mechanical systems and contributed to the open source materials modeling package Quantum ESPRESSO.

Developed methods for computer modeling of solids and molecules.

EDUCATION

University of Minnesota, Twin Cities, MN — Ph.D. Physics 2010

Bilkent University, Ankara, Turkey — B.S. Physics 2005

TECHNICAL SKILLS

Statistics and Machine Learning:

1. Expertise in classification, regression, decision trees, ensemble models, support vector machines, unsupervised learning, deep neural networks.

2. Expertise in analysis of data for biological significance: differential gene expression analysis, multiple hypothesis testing, sequence motif discovery and biological networks.

Programming Languages:

1. High level prototyping/scripting: Python and R with expertise in Numpy/Scipy, Tensorflow, Pandas (Python) and Tidyverse (R) packages. Familiar with parallel data processing using Spark and Hadoop.

2. Low level, high performance production: C/C++ with expertise in numerical libraries including BLAS, LAPACK, FFTW and parallel programming paradigms MPI, OpenMP. Familiar with GPU programming using CUDA.

High Performance and Cloud Computing:

1. Working knowledge of AWS and Google cloud platforms. Expertise in training deep learning models on GPU instances.

2. Expertise in high performance computing environments, network file systems, schedulers and various linux operating systems.

SELECTED LIST OF PUBLICATIONS

Authored over 30 journal publications. Complete list available in google scholar.

1. Tree based machine learning framework for predicting ground state energies of molecules, Journal of Chemical Physics **145**, 134101 (2016), B. **Himmetoglu**.

2. Searching for high magnetization density in bulk Fe: the new metastable Fe6 phase, Journal of Physics: Condensed Matter **27**, 016001 (2014), K. Umemoto, **B. Himmetoglu**, J.-P. Wang, R. M. Wentzcovitch, and M. Cococcioni.

3. Hubbard corrected DFT energy functionals: LDA+U description of correlated systems, International Journal of Quantum Chemistry **114**, 14 (2013), **B. Himmetoglu**, A. Floris, S. de Gironcoli, and M. Cococcioni.

4. Instability of anisotropic cosmological solutions supported by vector fields, Physical Review Letters **102**, 111301 (2009), **B. Himmetoglu**, C. R. Contaldi, and M. Peloso.