Taylor Petty, Ph.D.

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SUMMARY

Computational statistician with 6+ years of experience in data analysis, statistical modeling, and interdisciplinary research. Extensive experience with large-scale high-performance computing workflows and reproducible software development.

TECHNICAL SKILLS

Languages: Python, R, C++

Statistical and scientific: NumPy, pandas, SciPy, tidyverse, Bioconductor, data.table, ggplot2

Performance and optimization: Numba, Rcpp, Armadillo, Gurobipy

Tools: Linux, git, SLURM, Apptainer, CI/CD (Bamboo)

PROFESSIONAL EXPERIENCE

Statistician **Durham, NC**
Sciome LLC *Jul 2023 – Present*

- Designed, profiled, and implemented parallelized out-of-core algorithm for scoring 600,000 lists of 40,000 genes each, leveraging SLURM on the NIH's Biowulf cluster, creating 7 TB of output
- Managed a summer NIEHS intern with regular meetings on how to use a statistical genetics package, resulting in a successful research poster
- Added to a C++ statistical genetics codebase by writing functions that interfaced with thousands of lines of existing code in an evolutionary algorithm
- Reviewed thousands of lines of virtually undocumented C++ to write Bayesian methods manuscript for toxicology
- Implemented multiple legacy scientific packages, including using containers for GPU compatibility

Graduate Researcher **Chapel Hill, NC**
The University of North Carolina at Chapel Hill *Aug 2018 – Aug 2023*

- Modeling and computing Bayesian evidence for presence of suspect at a crime scene
- Optimized Python using Numba for large-scale cluster computing
- Parallel computing with 10 GB of NIST forensic lab data
- Published DNA sequence similarity dynamic programming algorithm in peer-reviewed journal

Data Science Intern **Pleasanton, CA (Remote)**
Sestina Bio *Jul – Sep 2022*

- Wrote gene screening for synthetic biology using multilayer graph metrics in Python
- Tested predictive power of recommendation system with external toxin exposure data

Research Intern **Vicksburg, MS**
U.S. Army Engineer Research and Development Center *Jun – Aug 2021*

- Designed experiment and led a team of engineers testing lidar sensors for autonomous tanks
- Analyzed data in VeloView and R, published results in peer-reviewed journal

Math Instructor **Raleigh, NC**
Shaw University *Jan 2017 – Aug 2018*

- Taught 100-150 HBCU students per semester from diverse backgrounds, including extensive individual mentoring and tutoring

EDUCATION

Ph.D. & M.S., Statistics and Operations Research — **Chapel Hill, NC**
The University of North Carolina at Chapel Hill — *2018 – 2023*
- Advised by Jan Hannig and Hari Iyer

M.S. & B.S. (Cum Laude), Mathematics — **Provo, UT**
Brigham Young University — *2011 – 2015*
- Advised by the late Todd Fisher

PUBLICATIONS

Taylor Petty, Jan Hannig, and Hari Iyer. Bayesian Forensic DNA Mixture Deconvolution Using a Novel String Similarity Measure. *Under revision.*

Michael Nodzenski, Min Shi, David M. Umbach, Brian Kidd, **Taylor Petty**, and Clarice R. Weinberg. A Method for Finding Epistatic Effects of Maternal and Fetal Variants. *Front. Genet.* **2025**, 16:1420641. doi: 10.3389/fgene.2025.1420641

Taylor Petty, Juan D. Fernandez, Jason N. Fischell, and Luis A. De Jesús-Díaz. Lidar Attenuation Through a Physical Model of Grass-like Vegetation. *Journal of Autonomous Vehicles and Systems* **2022**, *2*(2), 021003. doi: 10.1115/1.4055944

Taylor Petty, Jan Hannig, Tunde I Huszar, and Hari Iyer. A New String Edit Distance and Applications. *Algorithms* **2022**, *15*(7), 242. doi: 10.3390/a15070242

Todd Fisher, **Taylor Petty**, and Sergey Tikhomirov. Nonlocally Maximal and Premaximal Hyperbolic Sets. *Contemporary Mathematics* **2017**, *692*, 83 – 99. doi: 10.1090/conm/692

AWARDS and FUNDING

UNC Dissertation Completion Fellowship — *2022 – 2023*
TIBBS ImPACT Scholar — *2022*
UNC Summer Research Fellowship — *2022*
NSF Stipend — *2020, 2022*
NSF Mathematical Sciences Graduate Internship — *2021*
UNC Doctoral Merit Assistantship — *2018 – 2019*
The Honor Society of Phi Kappa Phi — *2014*
Dean's List (BYU) — *2012*

LEADERSHIP and COMMUNITY

STOR Liaison, UNC Biostatistics Student Association — *2021 – 2023*
STOR Representative, UNC Computational Biosciences Club — *2021 – 2023*
President, UNC BIOSTOR Club — *2021 – 2022*
- Organized academic and social events between STOR and BIOS departments

BYU Math Department Student Advisory Council Member — *2013 – 2015*
- Met regularly with faculty to improve department
- Helped plan and run campus-wide Pi Day events

Three-palm Eagle Scout, Boy Scouts of America — *2009*
Various church leadership roles — *2005 – Present*