



# John Seibert

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EDUCATION	<b>Bloomsburg University of Pennsylvania</b> , Bloomsburg, PA B.S. Mathematics, B.S. Computer Science; August 2020 - December 2025 GPA: 4.0/4.0 Thesis: “ <b>Negative Latin Square Type Partial Difference Sets from Non-abelian Groups and their Product Constructions.</b> ” Advisor: John Polhill	
PUBLICATIONS	Berry, A. S. F., Finucane, B. M., Myers, S. M., Walsh, L. K., <b>Seibert, J. M.</b> , Martin, C. L., Ledbetter, D. H., & Oetjens, M. T. (2024). <i>A genome-first study of sex chromosome aneuploidies provides evidence of Y chromosome dosage effects on autism risk.</i> <i>Nature Communications</i> , 15(1), 8897.	
PAPERS IN PREPARATION	<b>Seibert, J.</b> , Polhill, J. <i>Constructing an Infinite Family of Negative Latin Square Partial Difference Sets in Nonabelian Groups.</i>  <b>Seibert, J.</b> , Nguyen, H., Li W., Ma W., Cui X. <i>Transcriptomic Age Acceleration in Alzheimer’s Disease: A Predictive Modeling Approach Using Age-Responsive Genes from GTEx.</i>	
RESEARCH EMPLOYMENT AND EXPERIENCE	<b>UC Riverside</b> NSF Fellow (NSF Grant #2244480) June 2025-August 2025 <ul style="list-style-type: none"><li>Developed and trained 3 machine learning models to predict biological age from high-dimensional bulk RNA-seq data.</li><li>Engineered a data preprocessing pipeline to clean, <math>\log_2(TPM + 1)</math> transform, and z-score standardize gene expression data from the GTEx v8 and GSE125583 datasets</li><li>Analyzed “brain-age delta” between AD and control groups using non-parametric statistical tests to confirm significant findings.</li><li>Implemented a feature selection process using linear modeling and Benjamini-Hochberg correction to identify and select 400 significant age-responsive genes from an initial set of over 20,000</li><li>Validated the primary hypothesis that Alzheimer’s Disease patients exhibit accelerated biological aging, demonstrating a statistically significant increase in predicted transcriptomic age vs. chronological age</li></ul> <b>Commonwealth University-Bloomsburg</b> Undergraduate Research, Scholarly and Creative Activities Grant May 2023-August 2023 <ul style="list-style-type: none"><li>Implemented a recursively-defined function (Mahler-Popken complexity) to define the “cost” of an integer relative to a set of 6 primitive recursive functions using Python</li><li>Conjectured the function and 6 primitive recursive functions are computable</li></ul> <b>Geisinger Health System</b> Summer Undergraduate Research Program Intern May 2022-August 2022	

	<ul style="list-style-type: none"> <li>• Queried and extracted data from the ‘All of Us’ research database to perform sensitivity analyses and correlate SCA status with cognitive performance and social determinants of health</li> <li>• Analyzed genomic and phenotypic data from two biobanks (Geisinger MyCode and SPARK) to investigate the association between sex chromosome aneuploidy (SCA) and autism spectrum disorder (ASD)</li> <li>• Identified proportions of 13 common symptoms of sex chromosome aneuploidies in the MyCode and SPARK biobanks</li> </ul>
HONORS AND AWARDS	<p>Susquehanna Valley Undergraduate Research Symposium 2023 Best Poster Award</p> <p>Community Government Association, Fall 2021 Senator of the Semester</p> <p>Bloomsburg University, Board of Governor’s Science and Technology Merit Scholarship</p>
GRANTS AWARDED	<p>Bloomsburg University Undergraduate Research, Scholarly, and Creative Activity Grant; Cost of an Integer (March 2023) - \$4,800</p>
ORAL PRESENTATIONS	<p><i>Predicting Biological Age in Alzheimer’s Disease Using Machine Learning</i>, Mathematical and Digital Sciences Seminar Series, Commonwealth University-Bloomsburg (September 2025)</p> <p><i>Transcriptomic Age Acceleration in Alzheimer’s Disease: A Predictive Modeling Approach Using Age-Responsive Genes from GTEx</i>, Riverside High School Data Science Camp at University of California, Riverside (August 2025)</p> <p><i>Evaluating the Cost of an Integer using Primitive Recursive Functions</i>, Mathematical Association of America EPaDel Section Meeting, Villanova University (November 2023)</p>
POSTERS	<p><i>Negative Latin Square Type Partial Difference Sets from Nonabelian Groups and their Product Constructions</i>, Eileen G. Jones Honors College Fall 2025 Capstone Symposium @ Commonwealth University-Bloomsburg (Bloomsburg, PA) (December 2025) [Presenter]</p> <p><i>Transcriptomic Age Acceleration in Alzheimer’s Disease: A Predictive Modeling Approach Using Age-Responsive Genes in GTEx</i>, Riverside High School Data Science Camp @ UC Riverside (Riverside, CA) (August 2025); SoCal REU Symposium @ Harvey Mudd College (Claremont, CA) (July 2025) [Presenter]</p> <p><i>Evaluating the effects of sex chromosome dosage on autism spectrum disorder risk</i>, 2023 American Society of Human Genetics Meeting @ Walter E. Washington Convention Center (Washington, DC) (November 2023) [Non-presenting author]</p> <p><i>Mapping Integers to the Smallest Description of an Integer Possible in Python</i>, COST Research Day @ Commonwealth University-Bloomsburg (Bloomsburg, PA) (May 2024); Susquehanna Valley Undergraduate Research Symposium @ Bucknell University (Lewisburg, PA) (July 2023) [Presenter]</p> <p><i>Sex chromosome aneuploidies and risk of neuropsychiatric disorders in two population based cohorts</i>, Susquehanna Valley Undergraduate Research Symposium @ Geisinger Medical Center (Danville, PA) (July 2022) [Presenter]</p>
INSTITUTIONAL SERVICE	<p><b>Community Government Association</b></p> <p>Senate Representative to Executive Board (23-24)</p> <p>Secretary (24-25)</p> <p>Sep. 2020 - Dec. 2025</p>

- Co-drafted and revised Academic Distinction policies regarding Dean’s List eligibility for part time students
- Interim chair for Committee on Student Organizations
- Approved \$2 million budget for Community Activities Office, funding student clubs and organizations campus-wide
- Wrote and compiled all Executive Board and Senate meeting minutes, ensuring a timely distribution

#### OTHER EMPLOYMENT

##### **Sekisui Kydex**

Manufacturing Technology Intern

May 2024-August 2024

- Consolidated 200 cloned FileMaker scripts to 7 streamlined prototype scripts, enhancing maintainability and reducing redundancy.
- Hosted a FileMaker archive database to store 4.5 million archived records for old tables
- Authored a document detailing best practices for creating FileMaker scripts to facilitate developer collaboration

#### TECHNICAL SKILLS

- **Languages:** Python, R, Java C/C++, SQL, JavaScript, HTML/CSS, JSON, GAP (Groups, Algorithms, and Programming),  $\text{\LaTeX}$
- **Frameworks:** PyTorch, Apache Spark
- **Developer Tools:** Git, Google Cloud Platform, VSCode, Visual Studio, PyCharm, IntelliJ, Spyder, Project Jupyter
- **Libraries:** pandas, NumPy, Matplotlib, shiny, bokeh, scikit-learn, JavaFX, SQLite, tidyverse, YOLOv8

#### REFERENCES

**Dr. William Calhoun** (Department Chair/Research Mentor)

Mathematics, Computer Science, and Digital Forensics; Commonwealth University  
wcalhoun@commonwealthu.edu

**Dr. Wei Vivian Li** (UC Riverside REU Mentor)

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**Dr. Wenxiu Ma** (UC Riverside REU Mentor)

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**Dr. John Polhill** (Undergrad Thesis Advisor)

Professor of Mathematics; Commonwealth University  
jpolhill@commonwealthu.edu

**Dr. Matthew Oetjens** (Geisinger SURP Research Mentor)

Associate Professor; Geisinger Autism and Developmental Medicine Institute  
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**Dr. Alex Berry** (Geisinger SURP Research Mentor)

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