Statement of Purpose [Draft]

University of [] - PhD in

Ryan Gallagher

I am applying to the PhD program in Program at University to advance my training in statistical methods and pursue my goal of developing and applying analytic approaches for genetics and public health data. I am deeply inspired by how statistics and mathematics, paired with computation, reveal structure in complex biological systems. This inspiration has shaped my research interests which center around improving causal models connecting genomic mutations to phenotypes. At University, I aim to refine these ideas into rigorous methods and apply them to large-scale biological data under the guidance of Program faculty.

My determination to pursue a PhD in Program grows from a sustained curiosity about how quantitative methods can clarify complex biology. I chose demanding paths in mathematics, physics, and statistics and combined them with research and applied projects that translated theory into practice. I built a record of successful applications of core methods through a sustained internship in healthcare analytics and biostatistical consulting projects, leading to full-time biostatistician employment where I continue elevating my capacity for professional research. My academic experiences have not only prepared me technically for doctoral study but also deepened my conviction that the most meaningful progress in genomics and public health comes from rigorous, methodologically grounded research.

My professional experience as a Biostatistician in the Advanced Genomics Lab at the Medical College of Wisconsin and Children's Wisconsin has been the most formative stage in refining my research interests and developing the skills necessary for impactful research. In this role, I designed and implemented production bioinformatics pipelines that included hybrid assembly of third-generation sequencing data and long-read sequencing variant detection and annotation, enabling analysis of nearly 100 pediatric genomes and contributing directly to rare-disease diagnoses. I also built statistically driven clinical QC reports for our CAP-accredited lab and led RNA-seq differential expression analyses supporting TKI drug research, demonstrating interdisciplinary domain knowledge in biostatistics, bioinformatics, and programming. These experiences have deepened my appreciation for how statistical and computational rigor can transform complex sequencing data into biological understanding. Working at the interface of statistical modeling and genomic data has inspired my central research goal: improving causal inference methods that connect genomic variation to phenotype. My ultimate career goal is to become an academic statistician, leading research that develops principled statistical methods for genomic data that lead to highly impactful public health outcomes.

University's well regarded Department of Department is ideally suited for my methodological, interdisciplinary research interests. I am open to pursuing topics outside of statistical genetics, but I believe that University's investment in genetic science through their School with genetics would allow for the prospect of developing novel methods using state-of-the-art data. The faculty that I am particularly interested in working with are Drs. Faculty 1, Faculty 2, and Faculty 3. I am interested in working with Faculty 1 because of their research in Work, Project. Faculty 2's contributions through Work would equally interest me as their Project demonstrates highly impactful research. I also believe that Faculty 3's work in Work would couple well with my interests. I know that the mentorship and training provided by the Department would well prepare me to accomplish my goals, and the proximity of City to my personal support system would allow for long-term success.

While I am eager to contribute to cutting-edge research, I am equally committed to advancing statistics education at University. I began nurturing this passion by teaching summer school alongside my mother during my undergraduate summers and continued as a graduate student tutoring calculus. More recently, as an Adjunct Professor at the University of Wisconsin–Milwaukee, I designed and taught a graduate course, Predictive Analytics in Healthcare, where I introduced students to R programming and statistical learning in the context of real-world health data. These experiences reaffirmed how teaching strengthens understanding for both instructor and student. Coming from a family of educators, I view teaching as a vital complement to research, and I hope to continue developing as an instructor and mentor throughout my doctoral training.

Ultimately, I aim for an academic career developing principled statistical methods for genomic and public health data and mentoring the next generation of scientists. The PhD in Program at University offers the methodological depth, collaborative infrastructure, and mentorship culture needed to translate rigorous models into measurable public health impact. I plan to focus on statistical genetics and causal modeling while remaining open to related areas where careful methodology can drive clinical insight. I am eager to contribute my experience with large-scale biomedical data and to grow as a researcher, communicator, and mentor in your community.