To whom it may concern,

I am seeking a career that will allow me to use the skills that I have developed throughout my PhD—a career requiring the solution of difficult and intricate technical problems, backend software development, collaboration, and project management. My technical skills in programming and mathematics from writing tens of thousands of lines of code in C++, Matlab, Javascript, and many other languages as well as from countless hours on calculations and proofs in many areas of mathematics will allow me to accomplish difficult analytical tasks. Additionally, the research projects that I have led and participated in have given me years of experience in planning and pushing difficult projects to completion as well as collaborating with and managing other researchers. Below, I elaborate on my technical, research, collaborative, and managerial experience.

In a nutshell, my PhD research has been to develop mathematical models of the behaviors of individuals within their social networks, to study these models both mathematically and computationally, and to develop applications of these models. As part of a $6.25m project with the DoD’s Multidisciplinary Research Initiative Program (MURI), I developed a belief dynamics model to investigate how group-based communication, such as meetings of individuals, affects belief trajectories when individuals have a bias towards conformity. Using properties I discovered about the model, I suggested practical methods by which an outside influencer could accelerate convergence to a consensus of beliefs within the network. We will be submitting the first paper of this project during the next month.

As part of my thesis research, I have thousands of hours of experience in software development and statistical computing. First, I developed a probabilistic model of user messaging patterns based on the queueing structure of online social networks. Second, I developed an algorithm for parameter estimation and discovered important mathematical properties of the model. Thirdly, I used the algorithm and mathematical properties to apply the model to both estimation and inference: estimation of the messaging patterns of users online and inference of missing data from social network datasets. My thesis and corresponding papers are in preparation and will be completed over the coming months.

As part of the MURI project, I have gained experience collaborating, designing and executing a research plan, communicating research ideas and goals, and managing relationships with other members of the research team. I have worked extensively with researchers at UCLA, USC, and Washington University in St. Louis. I initiated, planned, and led the belief dynamics project discussed above, creating a research plan and suggesting ways other members of the research team can get involved based upon their strengths. Recently, I was tasked with starting a new collaboration with researchers at Washington University: I flew to St. Louis as a liaison to communicate research ideas and decide on and initialize new focus areas for the project.

Above, I sketched out a few of the formative projects and experiences I have had throughout my PhD. I look forward to discussing ways I can contribute to the business of your company.

Thank you for your consideration.