Statement of Goals
Patrick Pragman

First and foremost, my sincere goal with this course of study is to obtain a master's level education in computer vision. In particular, by way of the research associated with this education, I desire to learn new tools that I can apply to solve pressing issues in Alaska from a data-centric standpoint. I want to build a skill set that allows me to tackle big, interdisciplinary problems with modern data science tools. I want to use computer science, mathematics, and statistics to make the world a better place while contributing to meaningful science.

How did I – a former bush pilot end up in the position where I even have the opportunity to tackle quantitative graduate-level courses? The fine people reviewing this document have my transcripts – largely I'm an amateur student – I've always enjoyed learning, but my focus was always on airplanes and flying after high school. What brought me to the realization that I needed to go back to school? Frankly, it was almost by accident. The real history of my new story starts in 2016 after I had been flying for a living for about nearly a decade.

In 2016 I was flying medevac in Hawaii. My family and I had decided to live outside Alaska for a few years to thaw out. While I was there, I heard an interesting applied mathematical problem. Effectively stumped by a variation on the Brachistochrone problem, I realized the mathematics education I'd received when I got my first bachelor's degree (in aviation) was insufficient. I went back to school online and worked to learn what I needed to know. While that problem faded in importance in my life, the immense satisfaction I got from solving quantitative problems remained strong. Around that same time, I started self-teaching Python to try to solve some problems in aviation.

In November of that year, disaster struck – I was suddenly and inexplicably rendered blind in one eye. I didn't know it at the time, but this would be crucial to my academic growth. Unable to fly for a living for two years, I focused on my studies and completed my BS in Mathematics while working part-time, and trying to get back to flying. I was able to return to the cockpit for just shy of

two years before disaster struck again while I was flying on the Slope. My other eye failed me and after a significant medical investigation, it was discovered that I had Multiple Sclerosis, suddenly I was out of flying permanently.

Though this time was – and I do not exaggerate when I say this – the worst time in my life, there was a silver lining. Now that they knew what was wrong, I could be treated properly. It was hard – it still is hard – but I got better. I was able to see well enough to use my computer the following summer and leaned into programming. I started building portfolio projects in the summer of 2021, turning my programming hobby – which I had been using to try to automate the less exciting paperwork associated with bush flying – into a real career. I taught myself as much as I could about the tools, the processes, and how professional programmers work. I read voraciously about everything I could find related to computer science and continue to do so.

Leveraging my considerable experience in aviation (I have over 7500hrs of flight time over more than a decade spent in small aircraft), I got hired as a contractor for a New Zealand company and discovered what was possible with big data. We were tracking aircraft with our hardware and providing data-driven insights into operations. We could tell operators about the quality of aircraft performance, how safe it was being flown, location data, and much more; if used properly, our data could make a real difference in air safety by providing feedback between management and operations. I saw the power of data firsthand and I was hooked. I wanted to use these tools to solve real-world problems – not just in aviation, but everywhere.

This job, however, was only part-time. If I wanted to advance in the field, I needed more education not only to be employable but to learn the necessary skills to succeed. While I might be able to teach myself about machine learning and data science on YouTube and Wikipedia, the reality is that I would not be able to give myself adequate depth to accomplish what I desired. I could go to a "coding boot camp" – but a 30-day course on how to apply libraries will not make me an expert in the field. I need to go and get a real education, where I learn from experts and conduct meaningful research. I need to go to school.

In April of 2022, I decided to go back to school in earnest for computer science. Soon after I applied, I heard of this exceptional opportunity from Dr. Frank Witmer, and have been extremely excited at the potential to undertake this research. The graduate study plan I've designed points exactly in the direction I want to go – I can get good at software engineering and learn the intricacies of using big data to solve problems. I may not be able to fly again, but I can use computer vision to do real quantitative work that solves real problems – and the best part is it involves a field I'm passionate about.

I am uniquely suited for this research and educational track. I understand the problem space viscerally from years of experience in Alaska aviation. I have the required undergraduate experience in Mathematics which prepares me for the quantitative aspects of this program. I have a deep love of learning that has kept me taking courses for my entire adult life. I've spent my whole life searching out knowledge and trying to solve problems, and what is better for a guy with poor sight than to work in computer vision? It's the ultimate automation problem - If I can't see properly, I'll make the machines see for me.

If I am awarded this opportunity, I will use what I learn to empower citizen scientists to solve real problems – ultimately, that's what this is about – we can use computer vision to make the world better. With this new toolbox, I believe I'll be able to author a new career in the sciences and accomplish great things. The depth of knowledge and experience that I can gain from this education will be immensely beneficial to my future and I am uniquely qualified to assist the university with domain experience in aviation. Let's solve these hard problems together as I learn to participate in the scientific process – this is just the beginning!