**Discuss the three areas of study you are proposing, how they fit together to lend themselves to interdisciplinary study, and the rationale justifying why an interdisciplinary degree is being sought, as opposed to a degree based in a single discipline. Also discuss how your proposed academic objectives will help you meet your career goals or other goals beyond earning the MAIS degree. The statement should be 750-1000 words. \***

**Overview**

**Discuss the three areas of study you are proposing**

The interdisciplinary program I am proposing combines Oceanography, Computer Science and Statistics. I am currently speaking with faculty in both the Physical Oceanography and Ocean Ecology and Biogeochemistry specializations. In Computer Science I am planning to pursue a focus on Artificial Intelligence and have begun speaking with faculty in the EECS Department. I chose statistics as my third area of study since I think it will be useful working as a researcher and its applications to the field of artificial intelligence.

**How they fit together to lend themselves to interdisciplinary study**

I think one of the main ways these fields fit together for interdisciplinary study is allowing computer science to revolutionize the field of oceanography similar to how it is transforming the world around us. This type of research is being utilized more often including here at Oregon State University. For example, Professor Hutchinson is utilizing machine learning and statistical modeling to research ecological based questions. She holds an appointment in both the College of Electrical Engineering and Computer Science and also the Department of Fisheries and Wildlife. Her research in ecology has uncovered new challenges and research questions that are being brought back to the field of computer science. Another example is Professor Nash who is a Professor in the College of Earth Ocean and Atmospheric Sciences. He is working with the Robotics Department to develop autonomous vehicles for physical oceanography research.

My goal for the MAIS Program is to more solidly define my research focus but I have two major focuses that I hope to look into and then narrow down. The first is utilizing principles of artificial intelligence to solve challenging research questions in oceanography. Some examples of this might be utilizing principles of computer vision or natural language processing to process and handle complex data. The second is working with massive data sets through computational methods. One of the challenges of ecological research is the vastness of the earth systems that are worked with. Being able to combine or share data more easily among scientists could lead to developing models that are more complex and accurate.

There are a lot of fields in Computer Science that are being applied to other scientific disciplines but I am particularly interested in utilizing Artificial Intelligence. As I attend seminars, read scientific publications and engage with faculty my research questions will become more solidified but I have three major areas that I am currently interested.

The first would be exploring the use of neural networks in large data sets.

The second would be exploring ways to apply computational methods on large existing data sets to develop and test new hypothesis by combining data taken across years of scientific research.

The third builds on the second point and is related to the ability to share and access data. While working as a Software Engineer I was involved in a number of projects with a complex mess of data that was often lost or buried or difficult to move across systems. I am interested in exploring ways to make data easy to use and accessible for scientists. One small example might be developing a standardized way for a team of researchers to collaborate. For instance utilizing a JSON format on a cloud platform with a RESTful endpoint. Some applications for this could be working on paleoclimate research with Professor Brookes or working on software for autonomous vehicles with Professor Nash.

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there is a huge more complex and powerful computer science techniques are not being utilized to their full potential in many ecologically based fields. This type of interdisciplinary research is being conducted more and more but the fields often remain separated. I feel the MAIS Program would allow me to gain have an immersive experience in both fields that I will be able to take with me throughout the rest of my career.

while gaining a deeper understanding at the graduate level of both courses and research.

My goal is to become a Professor and I hope to utilize computational methodology in an ecological field like Biological or Physical Oceanography. I think that there is a lot of incredible ecological research that can be conducted by bringing in new methods and tools from areas of artificial intelligence, machine learning, robotics and artificial intelligence. This type of research is being done more frequently and many NSF Research Grants now focus on this type of interdisciplinary research.

**The rationale justifying why an interdisciplinary degree is being sought, as opposed to a degree based in a single discipline**

I really felt strongly that an interdisciplinary degree is the perfect choice for my current research goals.

My rationale for choosing an interdisciplinary degree is that I feel it will allow me to develop the research and academic skills I need to be able to pursue a PhD in a more specialized field. I also want this time to be able to learn about my own research interests more deeply before beginning a PhD. I am not completely sure if my research goals are more aligned with pursuing a PhD in a Computer Science Department or in a more Ecological based Department and feel the MAIS Program will allow me to solidify my personal feelings on this matter. My goal for being in this program is to discover more about myself and where I see the best career path. I feel this program would allow me that opportunity by being able to engage in the classroom, with faculty and in research in both fields as I learn and discover what would be a strong fit for me personally. I also think this would allow me to really learn about my self before deciding on a PhD route since that is a major decision to commit to.

**Also discuss how your proposed academic objectives will help you meet your career goals or other goals beyond earning the MAIS degree.**

My long term objective is to gain my PhD and then pursue a position as a tenure track professor. I am confident this MAIS degree would be foundational in my ability to be successful and pursue a PhD for a number of reasons. One of the other reasons that I am excited about this program is that. There are two other important aspects in that I feel this

A few goals I have in this program is to work hard to find a research project that would align well with this program. I have already begun reaching out and setting up meetings with faculty and graduate students in these disciplines and plan to do so through Fall Term. I also hope to taken a number of research based seminars and some reading and conference courses to help narrow my research focus. I have already found a number of schools I am interested in applying for my PhD in and am planning a visit to them. As part of this I am also looking at research being conducted their in order to hopefully spend my time in the MAIS Program. My plan is to engage more deeply into current publications and research of faculty to see what direction my master’s thesis may head but I have three main ideas.

I gained my master’s degree in the College of Nuclear Science and Technology where my research was funded through the Nuclear Regulatory Commission. Since then I have been working as a Software Engineer and completed my MBA. I plan to work with my graduate committee to have all the work I do in the MAIS Program be beneficial towards my PhD.

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As soon as I found the MAIS Program I felt it was an ideal fit for my current research interests at the master’s level.

Personally, I feel there is a tremendous amount of new and exciting research that can be done in the fields of biology, oceanography and ecology by utilizing cutting edge research in computer science. I plan to pursue Oceanography in the College of Earth Ocean and Atmospheric Sciences as my primary track. As my secondary track I hope to pursue Computer Science with a focus on Artificial Intelligence. Finally, I am interested in Statistics because I feel this will be foundational to my overall ability to conduct research as a scholar throughout my career in academia.

I don’t intend to pursue all of these areas but have a plan to spend Fall Term working to outreach to faculty, attend research seminars, explore funding and most importantly read through research literature to create a strong research plan.

I immediately felt an interdisciplinary field would be ideal for my career goals master’s as it would allow me to take courses and develop relationships with faculty across disciplines.