

DIGITAL SIGNAL AND IMAGE PROCESSING

OVERVIEW

Signal processing is the enabling of technology for the generation, transformation, extraction, and interpretation of information, where information can be in many different forms. Information-containing signals include audio, speech, images, video, medical recordings (EKG, EMG, ultrasound, etc.), sonar, radar, communication transmissions, sensor outputs, financial data, text documents, and more. Signal processing leverages mathematical and computational methods to address problems in the wide array of applications associated with these different forms of data. Signal processing is the ECE side of Data Science. Obtaining or predicting information from signals is a fundamental problem in artificial intelligence and machine learning.

AREAS OF IMPACT

- Air & Space
- Computing Data and Digital Technologies
- Environment Sustainability and Energy
- Health and Medicine
- Infrastructure Transportation and Society
- Robotics and Manufacturing

WHAT RESEARCH OPPORTUNITIES ARE AVAILABLE TO UNDERGRADUATES IN THIS CONCENTRATION?

Research opportunities can be in a variety of application areas depending on interests of the particular faculty member, including computer vision, speech and language processing, neural signal processing, and bioinformatics. Different faculty members have different needs and expectations for students, so it is best to check to see if there is information on the faculty member's web page and ask to talk with them if you think their work is of interest to you. Many faculty members expect students to have programming experience.



STUDENTS MIGHT BE INTERESTED IN THIS CONCENTRATION IF THEY ENJOY:

Math, programming, audio/video creation, data science and artificial intelligence (AI)

WHAT CLASSES OUTSIDE OF ECE WILL HELP STUDENTS LEARN RELATED AND USEFUL SKILLS?

Math and computer science

WHAT KIND OF INTERNSHIPS DO STUDENTS PURSUE?

Because data science touches virtually every industry these days, there are opportunities in companies big and small in a range of application areas. It can be useful to do internships in different companies to get a better sense of the range of opportunities in this field.

WHAT KIND OF PROJECTS DO STUDENTS COMPLETE IN THEIR CAPSTONE?

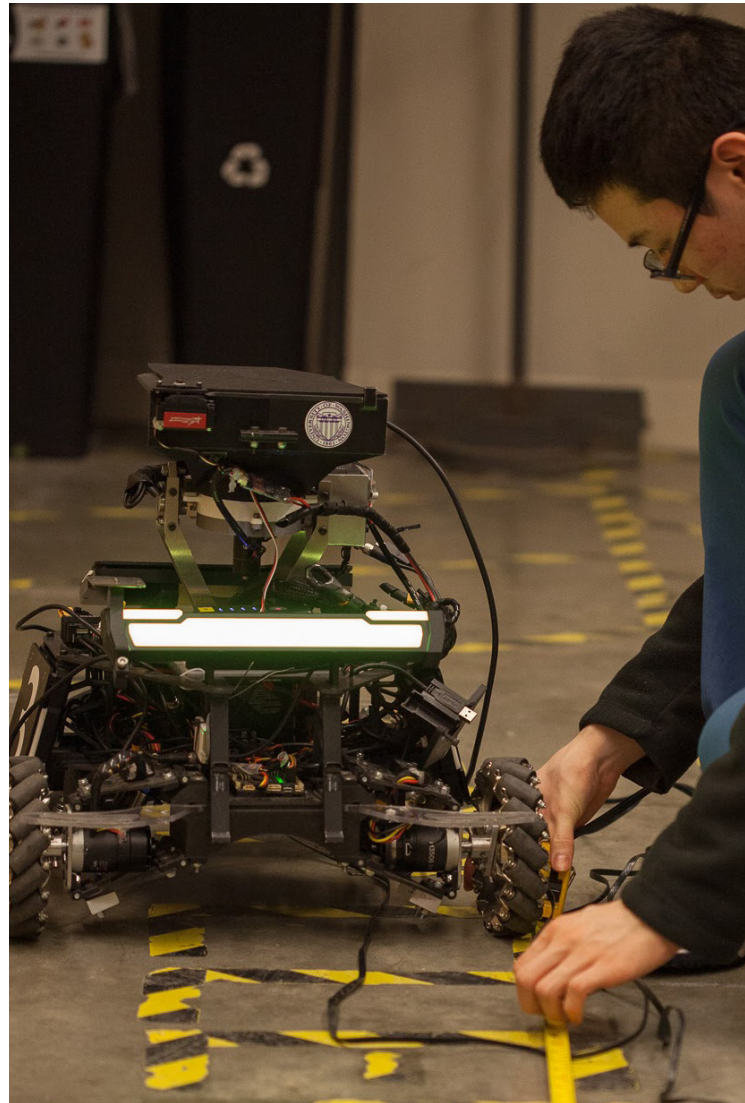
Some capstones are focused on this concentration area, often involving AI applications. Other multidisciplinary capstone projects benefit from having a student with signal processing and data science expertise on the team.

WHAT KINDS OF JOBS DO STUDENTS GET AFTER GRADUATING?

Jobs often depend on the degree – see next question. Students have taken positions at Boeing, T-Mobile, Microsoft, Amazon, Google, Facebook, Apple, Adobe, RealNetworks, etc., as well as at small companies in the local region. There are many job opportunities in the Northwest, but students also take positions in companies around the country.

DO STUDENTS NEED A GRADUATE DEGREE SPECIALIZING IN THIS AREA TO BE MARKETABLE IN INDUSTRY?

A BS is fine for work in sales, marketing, technical support, etc. To do more hands-on product development, an MS degree is very useful. For work in research, a PhD is often needed.



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