

PROJECT TITLE: Exploring water as a cutting tool

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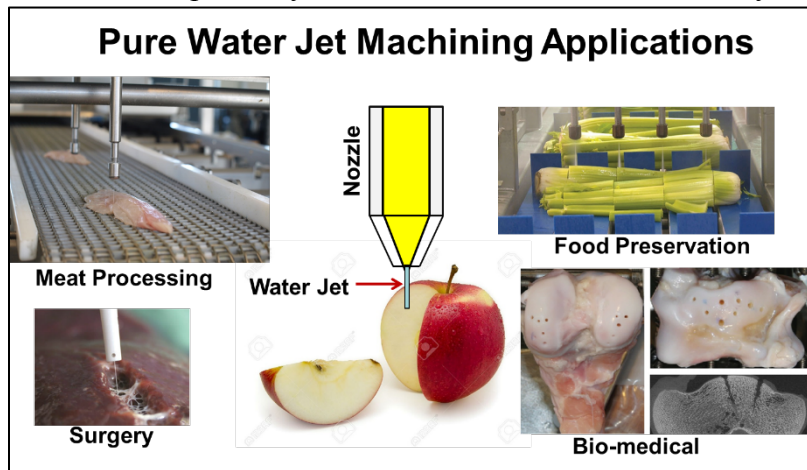
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Project Description

Material removal using high pressure water (water jet machining) is an emerging manufacturing method. Water jet machining has several applications in the biomedical and food processing industries due to its non-thermal nature, bio compatibility, and selective material removal. Hydro jet – a variant of water Jet machining is preferred during certain surgeries as the tumor may be selectively removed with minimal damage to surrounding blood vessels (ischemia) and veins. In food processing industry water jet cutting is preferred as it results in lower cross contamination when compared with traditional blade cutting.



As part of the project the student will perform experiments using the custom built micro water jet system at the *Micro and nano manufacturing lab*. The student will also work with simulating the process to understand the machining characteristics of the process. Different work materials will be machined ranging from bio-materials to soft metals.

Learning opportunities for students

As this research is multidisciplinary in nature, it offers tremendous opportunity for undergraduate students to be exposed to **interdisciplinary research**. The project will also introduce students to the various aspects of academic research starting from literature review to report preparation. The experimentation involved will offer **hands-on** experience in research for the student. Students will learn about the theory behind the water jet machining process, and understand the workings of the water jet machine at the Micro and Nano Manufacturing Lab. Learn to use simulation software's such as COMSOL, ANSYS and Matlab to interpret the findings of the theory. The undergraduate student will also be encouraged to present the work at either a **conference** and/or prepare a **paper** for journal publication.