Spring 2024 SEAMTN Invited Seminar Series

Southeastern Advanced Machine Tools Network

Speaker
Sweta Baruah, Visiting Researcher, Purdue University

Date and time
Friday, February 2, 2024, 12 pm to 1 pm

Location
2030 Valley Vista Drive, Knoxville, TN

Title
A cutting tool architecture framework for alleviating parasitic mechanisms during metal cutting: A design-based approach towards frugal and sustainable manufacturing

Abstract
Parasitic mechanisms like chatter, tool wear, and plowing consume power in excess of that required for the actual shearing of metals during machining. In this talk, the speaker will discuss these mechanisms and outline a solution-based approach to mitigate their effect. A cutter design architecture with tool geometry features and surface texturing of rake face when coupled with a mechanochemical effect – an innovative concept that facilitates the easy cutting of difficult-to-machine metals – opens up the potential for application to various domains like automotive, aerospace, biomedical and energy. Based on a scientific design-based framework, the speaker will also discuss the *frugal* nature of this cutter design architecture.

Biosketch
Sweta Baruah is a visiting researcher at the Center for Materials Processing and Tribology at Purdue University. She recently submitted her Ph.D. dissertation on the design and development of a cutter for improving metal cutting efficiency in the area of *Sustainable Manufacturing*. Through the award of the prestigious Overseas Visiting Doctoral Fellowship by the Govt. of India, Sweta had the opportunity to work at Purdue and collaborate with scientists across the globe, national laboratories, and industry professionals. She is currently working on a project jointly funded by Saint Gobain Research USA and NSF to study the effect of various chemical media on material deformation mechanisms. She has a background in manufacturing processes with research experience in materials processing, data analysis, materials characterization and mechanical testing.