Smart approaches for the machinability analysis of biocomposites: Acoustic emission technique

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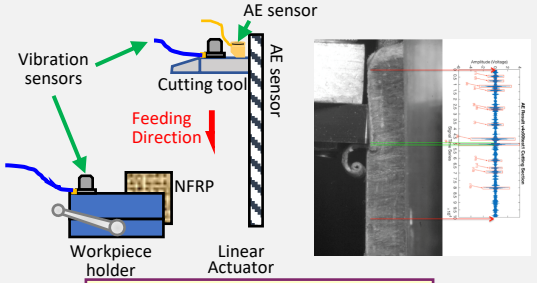
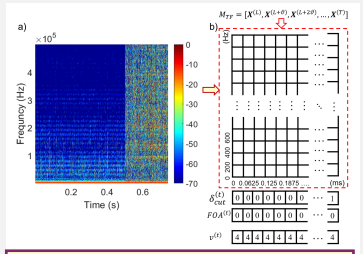
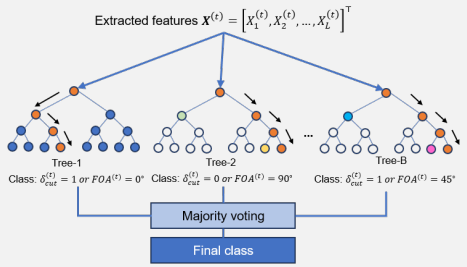
Acoustic emission for characterizing NFRP machining



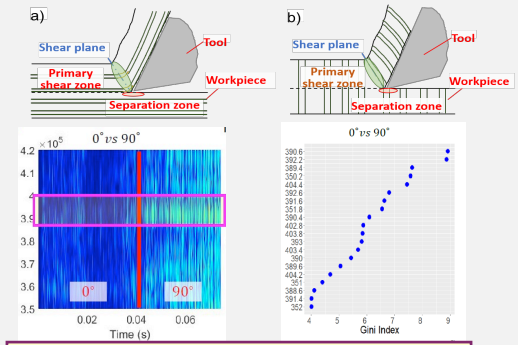
Experimental setup with smart sensing



Temporal-spectral feature extraction

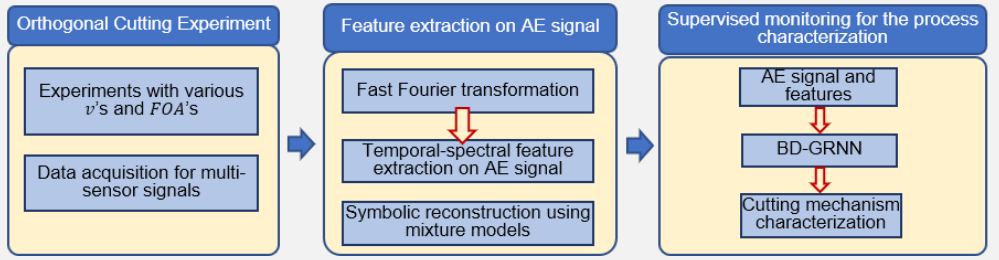


Random Forest based process characterizations

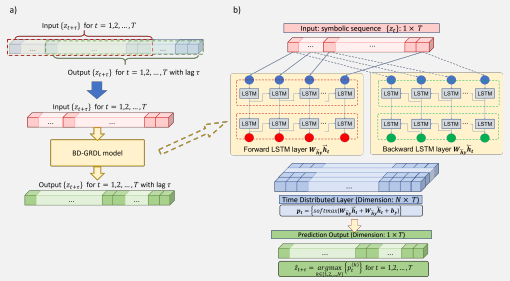


Connecting AE features related to the microdynamics of NFRP machining

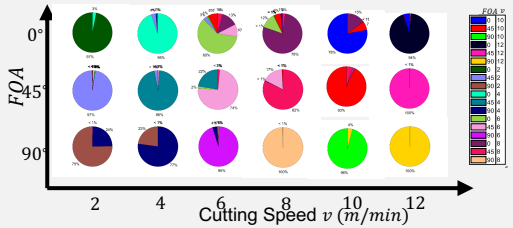
Deep Learning approach for process recognition



Framework of deep learning based process characterization for NFRP machining



Bidirectional recurrent deep learning for smart sensing



Results of process characterizations with overall accuracy ~87%

- Wang, Z., Chegdani, F., Yalamarti, N., Takabi, B., Tai, B., El Mansori, M., Bukkapatnam, S. "Acoustic emission characterization of natural fiber reinforced plastic composite machining using a random forest machine learning model", Journal of Manufacturing Science and Engineering, Transactions of the ASME, Vol. 142, Issue 3, 2020, art. no. 031003
- Wang, Z., Dixit, P., Chegdani, F., Takabi, B., Tai, B., El Mansori, M., Bukkapatnam, S. "Bidirectional gated recurrent deep learning neural networks for smart acoustic emission sensing of natural fiber-reinforced polymer composite machining process", Smart and Sustainable Manufacturing Systems, Vol. 4, Issue 2, 2020