Public Abstract
First Name:Benjamin
Middle Name:Taylor
Last Name:Edes
Adviser's First Name:Brian
Adviser's Last Name:Mann
Co-Adviser's First Name:
Co-Adviser's Last Name:
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The temporal finite element analysis (TFEA) method has been used in several publications to analyzeinterrupted machining dynamics and predict stable cutting conditions and surface location error. Thecutting process can be optimized and improved when a stable cut with low SLE is achieved. In this work, ahigher order hp-version TFEA method will be presented which offers the possibility of lowering computationtime. Also, in order to highlight the effect tool geometry has on stability and sruace location error in milling,TFEA results that do and do not ignore helical geometry are compared. In addition, simulation andexperimental data are presented in an effort to validate TFEA results for machining titanium (Ti6A14V)using a helical end mill tool. The analytical results shows that the tool geometery does effect stability andsurface location error, and the TFEA method is not fully validated by the experimental results for Ti6A14V. The research provides an improvement upon the TFEA method which can be used to improve productivity in the machining industry.