Robotic Finishing Platform

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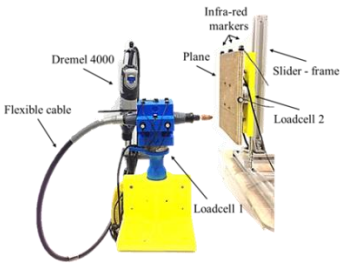
PROJECT DESCRIPTION:

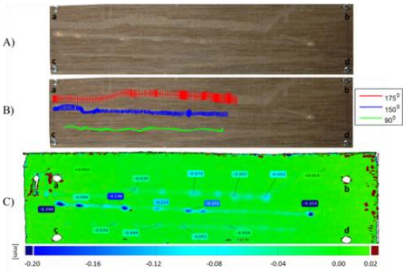
Motivation & Objectives

Implementing human like performance in industrial applications is a challenging task. This project aims to develop a novel tool to capture the relationship between a grinding tool and the work piece for future robotic implementation.

Methodology

A grinding tool has been instrumented with force sensors to measure 3D force and torques, and consequently the contact point between the tool and the work piece. The tool and its features have been studied during a grinding task.





Human skill acquisition Understand human coordination	Interaction with the tool	Force Interaction with the work-piece

Results / Progress

The results that have been validated using 3D motion capture, shows that that the contact point between the tool and the work piece can be precisely estimated. The material removal (which was quantified using a 3D scanner) and the contact ellipses have been traced on a work piece. The results of this proof of concept are promising and the proposed algorithms and features of the tool can be implemented in a variety of tools. In the near future, instrumented tools may be used by robots during industrial task in order to improve their performance and allow constant feedback, based on the contact point and 3D force estimations.

GRANT:

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PUBLICATIONS:

Refereed Journal (Published/In Press): *Nil*

Refereed Conference (Published/In Press):

Hoang, Phan Gia, et al. "Characterization of impedance rendering with a cable-driven agonist-antagonist haptic device." *Control Automation Robotics & Vision (ICARCV), 2014 13th International Conference on*. IEEE, 2014.