UNC CHARLOTTE
The WILLIAM STATES LEE COLLEGE *of* ENGINEERING

Senior Design Project Description for FALL 2016
Project Title: 3D Body Scanner (CPM_3DSCAN)

Supporter: Center for Precision Metrology
Supporter Technical Representative: ASSIGNED
Faculty Mentor: __X__ ASSIGNED _____ TBD (check one)
Single Team __X__ Dual Team _____ (check one)
Personnel (EN/ET): _____ E, _____ Cp, _____ Cv, __6__ M, _____ SE
(Complete if the number of students required is known)
Expected person-hours: (250 per student)

Description of Project:

Measurement capabilities in the UNC Charlotte Biomechanics and Motion Analysis Lab (Dr. Nigel Zheng) include a Cyberware 3D body scanner[1]. The 3D color scanner uses four scan heads to create a 3D data set of digitized {x, y, z} coordinates, including 24-bit RGB values for color (17 seconds for a full scan). Hundreds of thousands of points are collected in a single scan. The research objective of this project is to determine the resolution, repeatability, and uncertainty of the body scanner measurements.

[1]http://cyberware.com/products/scanners/wbx.html

Initial Project Requirements (e.g. weight, size, etc.):

The approach will be to design and manufacture one or more artifacts (or artifact assemblies) to assess the scanner performance. Using these artifacts, repeated scans at various locations in the work volume will be performed to quantify the measurement repeatability and reproducibility. This data analysis will require extracting dimensions from 3D point cloud data sets. The artifacts will also be independently measured using available metrology instruments, including a touch probe CMM. The validation metrology measurements will be compared to the scanner results to assess the scanner accuracy, including variation with work volume location.

The team members will learn to use Cyberware 3D body scanner.

Expected Deliverables/Results:

The deliverables for the project are:

1. Artifact(s) to enable assessment of resolution, repeatability, and uncertainty of the body scanner measurements
2. Measurements of the artifact(s) on metrology instruments, including a touch probe CMM
3. Assessment of the scanner resolution, repeatability, and uncertainty using the artifact(s)
4. Report of the results to the Center for Precision Metrology Affiliates Program

List here any specific skills or knowledge needed or suggested (If none please state none):
Willingness to learn to use Cyberware 3D body scanner
This project is approved as a Bioengineering project