HUMAN INSPIRED AUTOMATED LAYUP

Michael Elkington
Supervisor – Prof. Kevin Potter & Dr. Carwyn Ward
1: Understanding Hand lamination

- Woven Prepreg
- Doubly curved parts

Multiple repeated actions used to apply shear.
1: Understanding Hand lamination

- Layup trails: 19 Tasks, 6 laminators.
- Visual Analysis revealed 7 commonly used techniques
- Example: **Tension – Securing shearing**,
2: Pre-shearing – The evolution

Apply shear *Before* any contact with the tool

- Start with a kinematic model
- Apply shear prior to tool contact.
- Ply fits easily into tool.

- 60% reduction in *on tool* layup time
- Significant reduction in defects
- 75% less actions - Simplified
3: Automated preshearing

Preshearing is automated using a two part press
Custom end effector for six axis robot:
Shape and application methods inspired by the hand layup process.
Thanks you for listening.

Questions and ideas welcome.

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