Laboratory of Motion Generation and Analysis

Monash Epicyclic Parallel Manipulator

- Three-legged six-degree-of-freedom parallel mechanism
  - Three RRCU serial chains connect to common moving platform
  - Cable-pulley transmission
  - Base mounted actuation
  - Small moving mass and inertia

- Simpler geometric and dynamic models compared to other six-dof parallel mechanisms
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- Parallel singularities wholly dependent on orientation variables
  - Positional workspace has no interior singular regions

- Grassmann-Cayley Algebra used to obtain geometric insight into parallel singularities
Shown promise as a force-feedback haptic device

- User controls position, device reflects forces to the user
- Superior maximum rendered stiffness compared to two commercial six-dof haptic devices; comparable to another
- Improvements required such that user perceives minimal device dynamics, i.e. to improve ‘transparency’
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Students

- Mr T. Gayral, M. Eng, Graduated in 2012, IRCCyN, Nantes
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Collaborations

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Selected publications