ScMvr-13

Probabilistic-Diagnostic Informed Innovations for Power Transmission Lightweighting

S&T Campaign: Sciences for Maneuver
Energy and Propulsion

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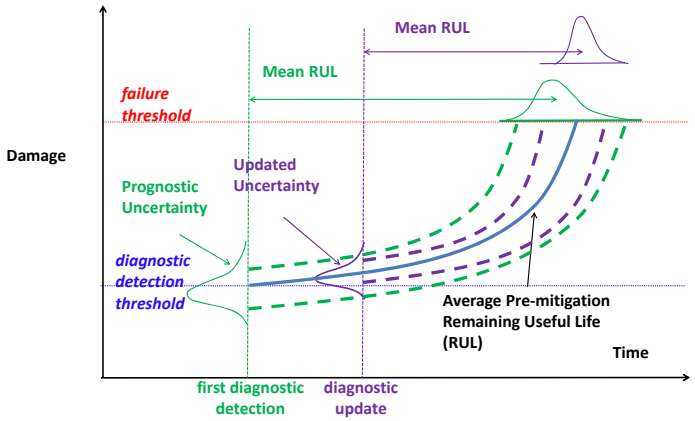
Research Objective

Develop innovative design concepts to optimize power density in drive systems of Army vehicles by leveraging advancements in health state awareness using a probabilistic and damage tolerance based framework

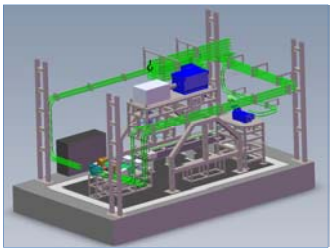


Challenges

- Quantifying uncertainty for probabilistic analysis
- Sensor technologies with high sensitivity to driveline component damage
- Updating component health in real time

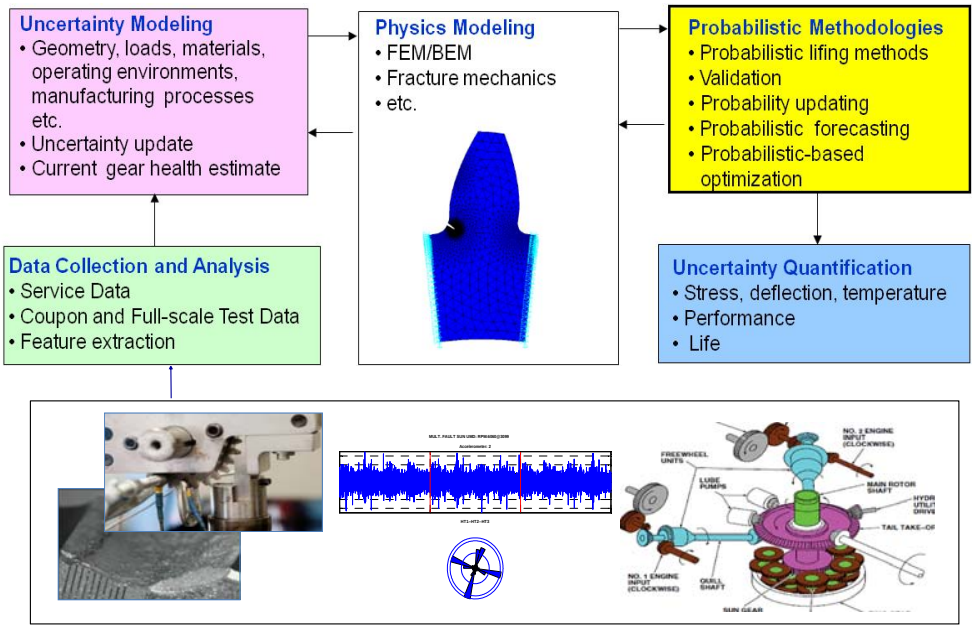
ARL Facilities and Capabilities Available to Support Collaborative Research

- Drives System Research Lab (coming in early 2016)
  - 2000 hp dual input helicopter transmission test stand
  - 1000 hp full scale tail rotor drive test stand
  - 250 hp ground vehicle driveline test stand
- Higher Performance Mechanical Component Lab
  - 25,000 rpm test stand
  - 60,000 rpm test stand
- Tribology equipment
  - WAM14 ball-on-disc tribometer
  - CETR UMT-3 tribometer
- Degraded grease bearing rig
- 22 kip load frames



Complementary Expertise/Facilities/ Capabilities Sought in Collaboration

- Expertise in helicopter drivelines and mechanical components
- Expertise in planetary gear dynamics
- Modeling and simulation for damage progression and failure prediction
- Expertise in probabilistic life estimation



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