Our Faculty

- Bert Bras
- Seung-Kyum Choi
- Kate Fu
- Roger Jiao
- Cassandra Telenko
- Chris Paredis
- Dave Rosen
- Suresh Sitaraman
- Yan Wang
- Julie Linsey
Do you have a passion for DESIGN?
Are you thinking about GRAD SCHOOL?
Want to keep that Mechanical Engineering credibility, and expand your career options?

Georgia Institute of Technology is hiring bright students like you to get their PhD in Mechanical Engineering Design!

There are at least 6 paid positions OPEN, to start in Fall 2016!!

Contact us directly if you’re at all interested. Application deadline is January 10, 2016

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Project needs:

• MyEnergiLifeStyle:
  – Integration of homes, electric vehicles, appliances, renewable energy, decentralized micro-grids
    • http://myenergilifestyle.com/

• Parking Spotter
  – Using vehicles as sensors to map parking and identify open spots

• Remote Repositioning
  – “Human in the loop” remote control of vehicles of 4g LTE network

• Sensor Fusion for Sustainability
  – Novel and innovative ideas for using vehicle sensors to enhance sustainability

• Biologically Inspired Design of Eco-Industrial Parks
  – Using ecological principles to group companies and manufacturing processes like species in an ecosystem to improve overall efficiency and lower the cost of operations and environmental impact
  – Special focus on steel manufacturing in China and automotive production
Robust Product Creation Laboratory

• Research Area (CAE and Design)
  Engineering Design under Uncertainty

• Research Focus
  Reliability-based/Risk-informed Design
  Optimal Design under Uncertainty
  Decision-based Design

Director: Dr. Seung-Kyum Choi
– E-mail: schoi@me.gatech.edu
– Web: rpc.gatech.edu

Project Examples
Reliability-based Design of Cellular Structures

Analytic Certification of Additively Manufactured Parts

Robust Design of Stretchable Electronics
Engineering Design Research Lab
Dr. Kate Fu  katherine.fu@me.gatech.edu  edrl.gatech.edu

Research Mission
• To understand, support and enhance design innovation and creativity
• Our approach is interdisciplinary and mixed methodological
• Design cognition research, methodological and computational design support development, and meta-research to improve our cohesion and formality within the field of design research.

Current Projects
• Design-by-analogy
• Data mining and visualization
• Computational support for conceptual design
• Design principles
• Ethical design
• Design cognition
• Design expertise
• Design intuition
2 Open Positions for Ph.D. Students in Fall 2016:
- Competent candidates are expected to have strong analytical and IT skills, critical and rigorous thinking, solid commitment, and be well motivated for intellectual challenges.

More info about research @ Google Scholar:
- [http://scholar.google.com/citations?user=9yikEHAAAAAJ&hl](http://scholar.google.com/citations?user=9yikEHAAAAAJ&hl)
Dr. Julie Linsey
julie.linsey@me.gatech.edu

What we do:
• Enhance Engineering Innovation
• Design Cognition- Integration of psychology & design
• Develop, design and evaluate new engineering tools & methods
• Engineering Education
• Analogy & Bioinspired Design

Current Projects
• Impact of Maker Spaces
• Persketchtivity- software tutor for engin. sketching
• Engineering Idea Generation
• Impact of Functional Modeling on Innovation
• Bioinspired Design

Meet our group!
https://sites.google.com/site/idreemlaboratory/
Research Focus:

Model-based Systems Engineering

- Formal modeling of SE artifacts
- Consistency management of models
- Simulation and model inference

Theoretical Foundations of SE&D

Value-based, explanatory modeling of systems engineering practices
- Research methodology for SE

Current Research Topics

- **MBSE for exploration of electrified system architectures**
  - Composition of analysis models for electrified drivetrains with SysML, Modelica and Simulink
  - With Ford Motor Company

- **Real-options analysis and design of flexible hybrid energy systems**
  - Efficient analysis and design of flexible, modular power plants that can be reconfigured in response to technological and economic changes
  - With Idaho National Labs

- **The role of heuristics in SE&D**
  - Understanding why heuristics are used in SE&D, and how this use can be made more effective

- **Model refinement for concept exploration in “wicked” problems**
  - Strategies for choosing the most valuable models to support decision making during concept exploration
  - With Renault and Ecole Centrale de Paris
Dr. Cassandra Telenko
cassandra.telenko@me.gatech.edu

**Computation and Advancement of Sustainable Systems Lab**

**What we do:**
- Discover, disseminate, validate, and integrate design for environment guidelines
- Model designs as part of a system with human and situational factors
- Design for sustainable user behavior, including psychology, sensing, and smart and feedback systems
- Design based learning for sustainability at college and professional levels
- Measure and improve environmental and usage aspects of 3D printing

**Why does this matter?**
- These are the tools needed by decisions makers
- Business platforms are innovating to be more sustainable and more system-oriented
- We have technology that isn’t being applied effectively
- User behavior is critical in sustainable design and engineering

Meet our group!
pwp.gatech.edu/telenko/researchers/
Dr. David Rosen
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Additive Manufacturing

• Design Methods & Tools: take advantage of the unique capabilities of AM

• Processes, Materials, Technologies: enable AM to be utilized for production manufacturing

Example Projects

• Cellular structure design
  • Light weight applications
  • Lattice structure generation; heuristic size optimization
  • Extending to topology optimization

• Stereolithography-based Microlens Process
  • DLP chip for area imaging
  • Interferometer-based real-time part height sensing and feedback control

Students to Contact

• Chad Hume:
  chume3@gatech.edu

• Narumi Watanabe:
  narumi.watanabe@gatech.edu
Research Topics

- Thin Film Delamination
- Compliant Interconnects
- Solder Reliability
- High Density Multi-Layer Substrate Studies
- Through Silicon Vias
• **Computer-Aided Multiscale Product-Materials Design**
  – Nanoscale CAD/CAM/CAE
  – Multiscale simulation (DFT, MD, kMC, FEA, CFD)
  – Heterogeneous geometry and materials modeling
  – Design space exploration and global optimization

• **Uncertainty Quantification**
  – Reliable multiscale simulation under uncertainty
  – Stochastic dynamics modeling
  – Risk analysis and risk-informed decision making

• **Product Lifecycle Management and Design Informatics**
  – Additive manufacturing: process monitoring, big data analytics
  – PLM system: interoperability
  – Geometry processing