TITLE: The Design Space Construction Vertically Integrated Project Team

GOAL: Develop and test design space exploration systems to support decisions like:

<table>
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<tr>
<th>What Massing for the Cancer Treatment Facility?</th>
<th>What Façade Dimensions for the Children’s Hospital?</th>
<th>What Section and Plan Dimensions for the high-rise?</th>
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TECHNOLOGIES: We use and develop a federation of tools, including:

- Eliciting stakeholder priorities: Survey, Wecision, ...
- Generating design alternatives: Grasshopper, Digital Project, Revit, Dynamo, ...
- Search algorithms: Combinatorial, Dynamic, Evolutionary, Gradient, Stochastic
- Visualizing Design Spaces: Magic Draw, SysML, Model Center, Excel, Wecision
- Process Management: Grasshopper, ModelCenter, Dynamo
- Decision Making: ModelCenter, Galapagos, Octopus, Wecision

RESEARCH ISSUES: Develop theories and methods to enable building and urban design and construction teams to efficiently construct more effective design spaces

TEAM ADVISORS: Experts in design computing, analysis and decision-making:

- Project Lead: John Haymaker, AIA, PhD (Building Construction and Architecture)
- Project Advisors: Daniel Baerlecken (Design); Matt Swarts (Parametric Modeling); Jason Brown (Energy Analysis); Russel Gentry (Structural Analysis); Pardis Pishdad (Organizational design and incentives); Baabak Ashuri (Risk analysis and decision making); Chuck Eastman (Data Integration); Chris Paredis (Systems modeling and simulation); …

PROJECT PARTNERS AND SPONSORS:
Autodesk, Perkins + Will, and other Georgia Tech Digital Building Laboratory member companies

DESIRED DISCIPLINES AND PREPARATION:
Undergraduate and graduate students with interest and skills in Architecture, Design, Design Computing, Structural, Mechanical, & Systems Engineering, Computer Science, Management Science, Human Computer Interaction, Education, and Cognition. Students are encouraged to also concurrently enroll in a sequence of two courses during the year that will deepen their experience and understanding.

- Fall 2014: Design Space Construction: Fundamental design computing, analysis, and optimization.
- Spring 2015: Design Space Exploration: Application of technologies on industrial projects.

Example student projects from Spring 2013, and Fall 2013

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