NVH-SQ RESEARCH GROUP

Noise, Vibration, Harshness ~ Sound Quality

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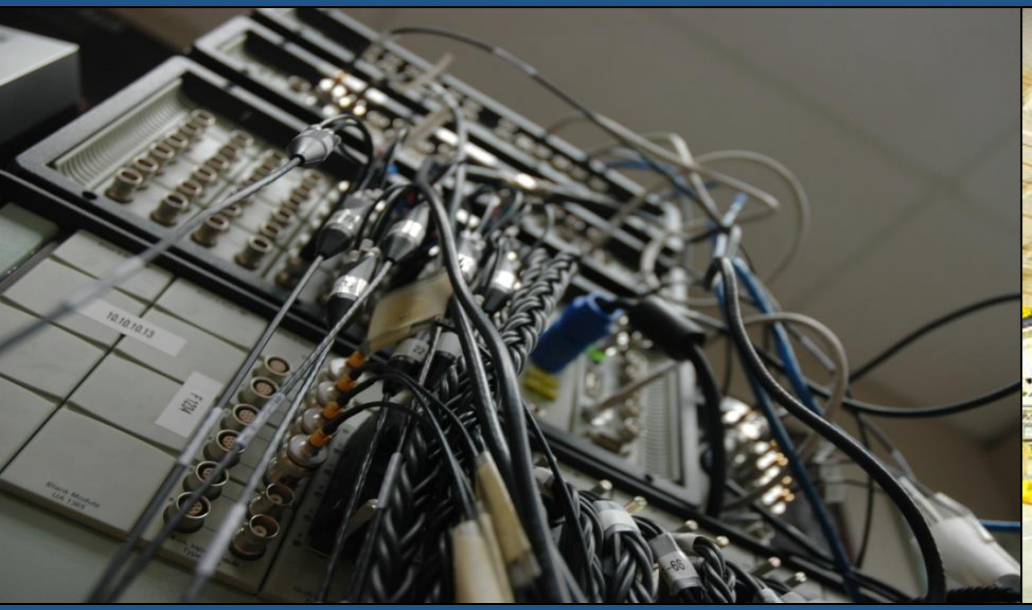

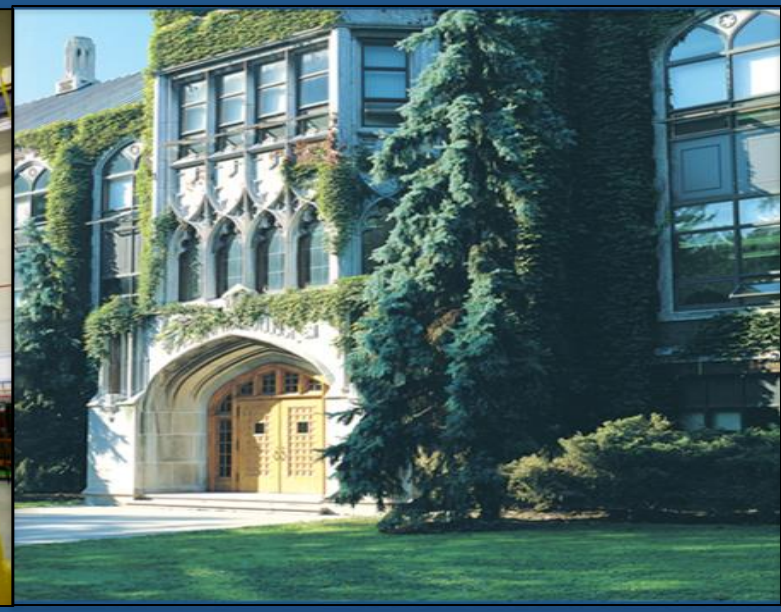

Using Simulator Tools in Higher Education
The Benefits and Challenges

University of Windsor

Welcome

Colin Novak

Professor and Director of NVH-SQ Research

University of Windsor
Faculty of Engineering

- Professor and director of the NVH-SQ research lab
- University of Windsor
- Windsor, Ontario Canada
- Research areas include automotive NVH-Sound Quality and development of psychoacoustic metrics

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Simulation

- *Simulation* is the act to replicate, predict or re-enact real situations using informed knowledge or experience in an interactive and/or virtual way

  My approach to simulation is that it is a Strategy – not a technology

- *Simulator* is a tool designed to replicate an action and maybe the environment with enough realism to fulfill a purpose

The Role of Simulator Tools in Higher Education

What is the Strategy?

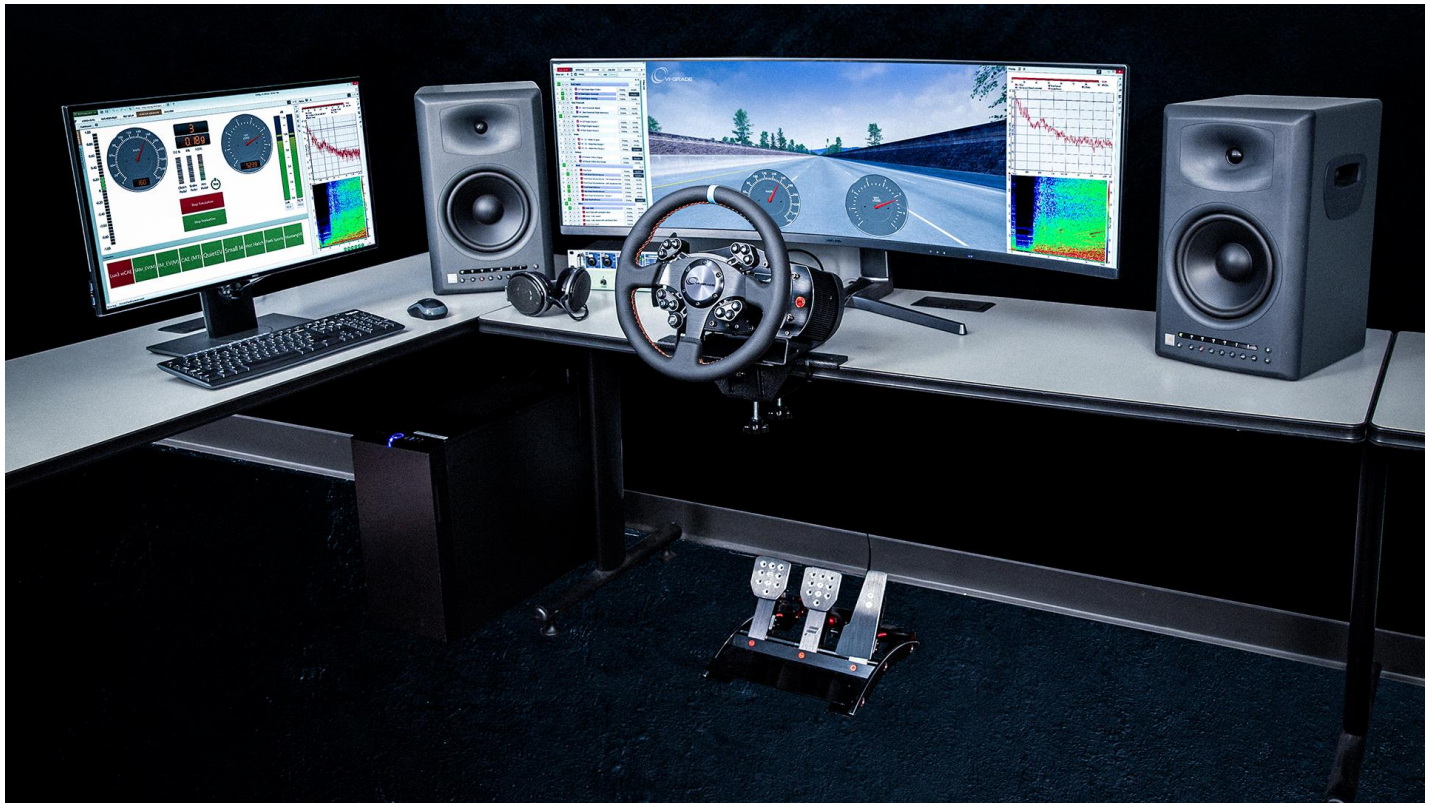
- A teaching tool
- A tool to evaluate
- Research
- Industrial collaboration

Strength of Simulation as a Teaching Tool

- PC based simulator tools have the flexibility of accommodating large groups of students at a time.
- Immersive tools are better suited for graduate student teaching if at all.
- Relatively low cost since the hardware infrastructure is already there.
- Learning materials can have varying degrees of complexity.
- Students can move at their individual pace
- Students can solidify and deepen their theoretical understanding with practice that is otherwise not practical or available.

Limitations of Simulation as a Teaching Tool

- Limited experiential learning.
- Low fidelity



Simulation as an Evaluation Tool

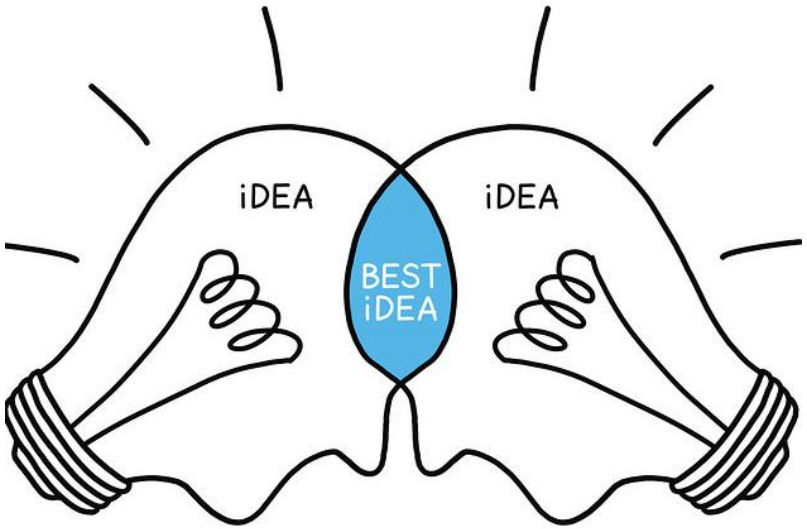
- Simulated laboratory experiments
- Project based learning
- Academic testing

Using Simulation for Research

- Higher education depends on their research programs to maintain innovation and relevancy in their programs.
  - This trickles down to the students
- Automotive NVH invariably will involve costly test, but much effort can be offset through simulation tools.
- Facilitates a wider breadth of research directions and “what ifs”.
- Graduate students benefit from the tools, industry benefits from the skilled experts upon graduation

Simulation Tools for Industrial Collaboration

- Research and industrial collaboration must be synergistic.
  - The benefits from Simulation Tools supports that synergy.
- Simulation Tools can shorten timelines and increase productivity.
- Provides opportunities for resource and data sharing.
- Industrial collaboration is like an extended job interview



Discussion and Conclusions

- Simulator tools must be chosen to meet the educational goals and objectives
- Complexity of the tool should match the level of the student
- The student should find the simulation engaging with enough realism
- Simulation tools promote the use of critical and evaluative thinking

Questions?