Department of Chemical, Civil,
and Mechanical Engineering

Enhancing Engineering Education using 3D Multimedia and Augmented Reality

DR. DIMITRIOS DERMISIS/PI
PROFESSOR MARTIN BEE/ART & TECH

Bringing it All to Life…

- AR quite literally brings lessons and learning to life fostering collaboration, interaction, engagement and understanding of a given topic. And let's face it if you say, 'Now please get your tablet or smartphone out and scan page 5' to a class of kids you've got their attention.
- By connecting the physical world of textbooks, lessons plans, and presentations with digital devices you and your students can add a new type of visual aid, splash of colour and excitement to any subject.

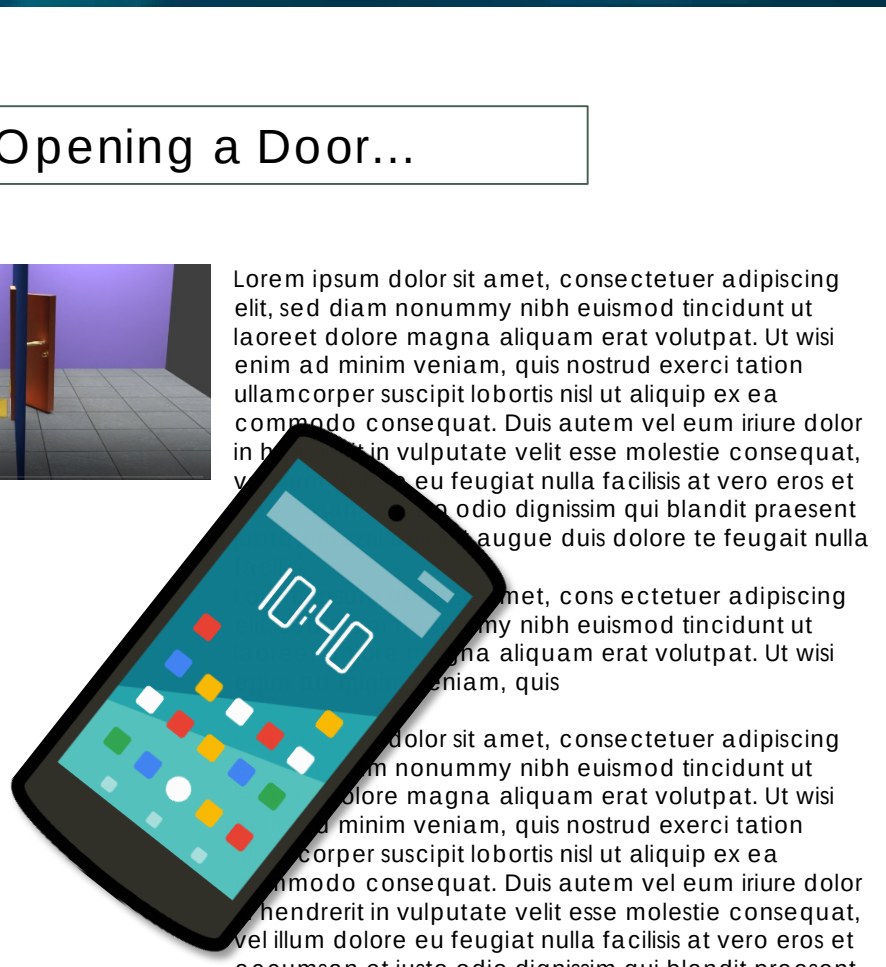
Course Selection

- ENGR 201: Statics for Engineers
- Introductory course for sophomore students
- Goal is to enhance traditional face-to-face class setting as well as complement e-textbooks
- Available to every student (open source material)

Department of Chemical, Civil, and Mechanical Engineering

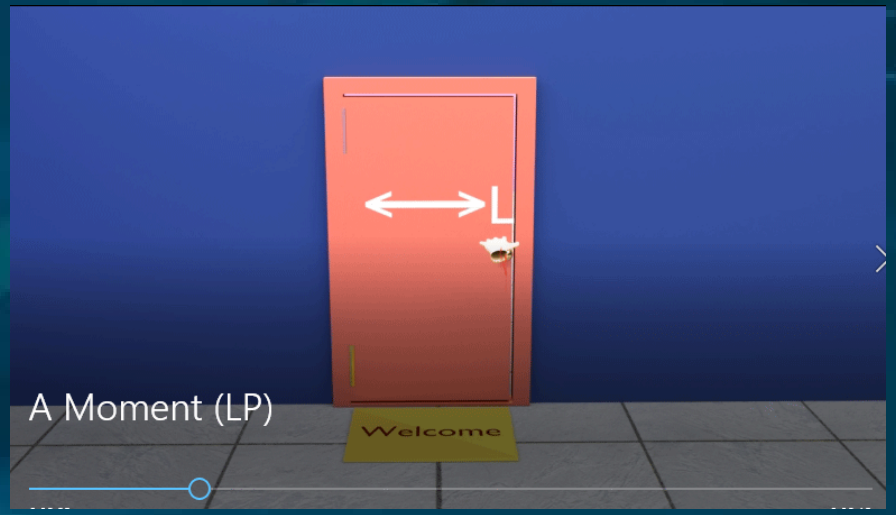
The Physics Behind Opening a Door...

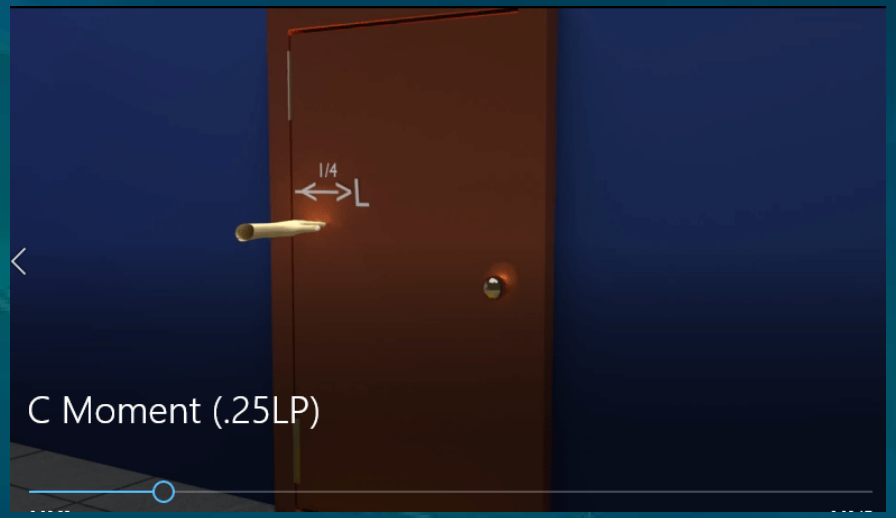
- Make a boring engineering text book come alive. The student sees a static image come alive when they scan the page with their phone, or see an animation pop up in their smart glasses. link



Department of Chemical, Civil,
and Mechanical Engineering

Work in Progress





Building AR Experiences

- Building and animating 3D model (Blender 3D)
- Exporting to the AR server
- Viewing Options
  - Target based (ZapWorks)
  - Hardware based (Smart Glasses)

Blender, the “Master Tool”

- Autocad, 3DSMax and other tools can be used. But Blender is free and imports directly into Unity 3D (you’ll see why this is important later.)
- Follow this link to down load.

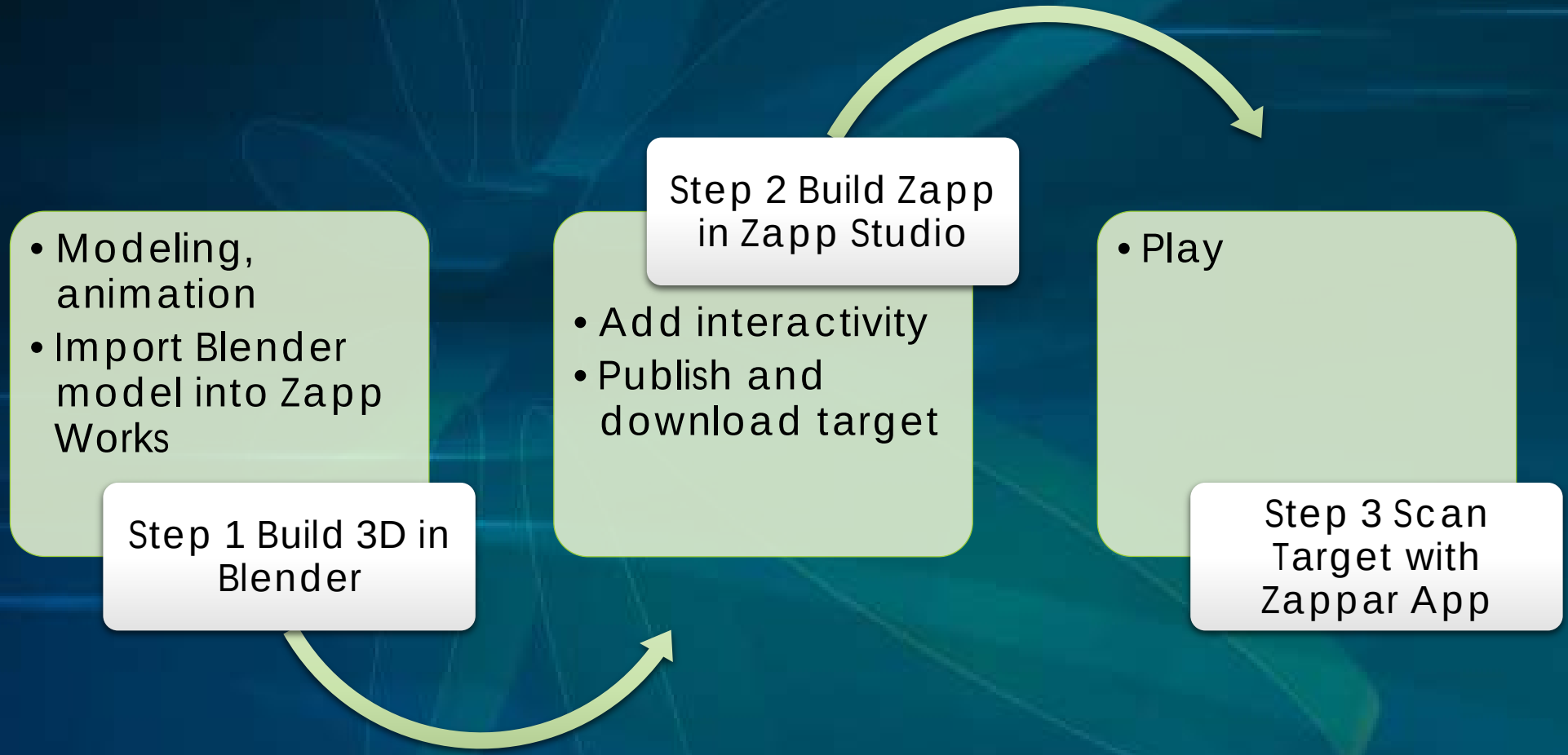
Department of Chemical, Civil, and Mechanical Engineering

Zapworks, Augmented Reality Using Targets

- Zapworks uses a free app installed on a tablet or phone that scans a target on a printed page or screen. This calls up a 3D animation "floating" above the page that can be interacted with.
- Follow this link to see an extensive showcase. Tools to make your own AR experiences come with the program.
- To get the viewer for your phone, search "Zappar" in your respective stores.

Department of Chemical, Civil, and Mechanical Engineering

Workflow for ZappWorks

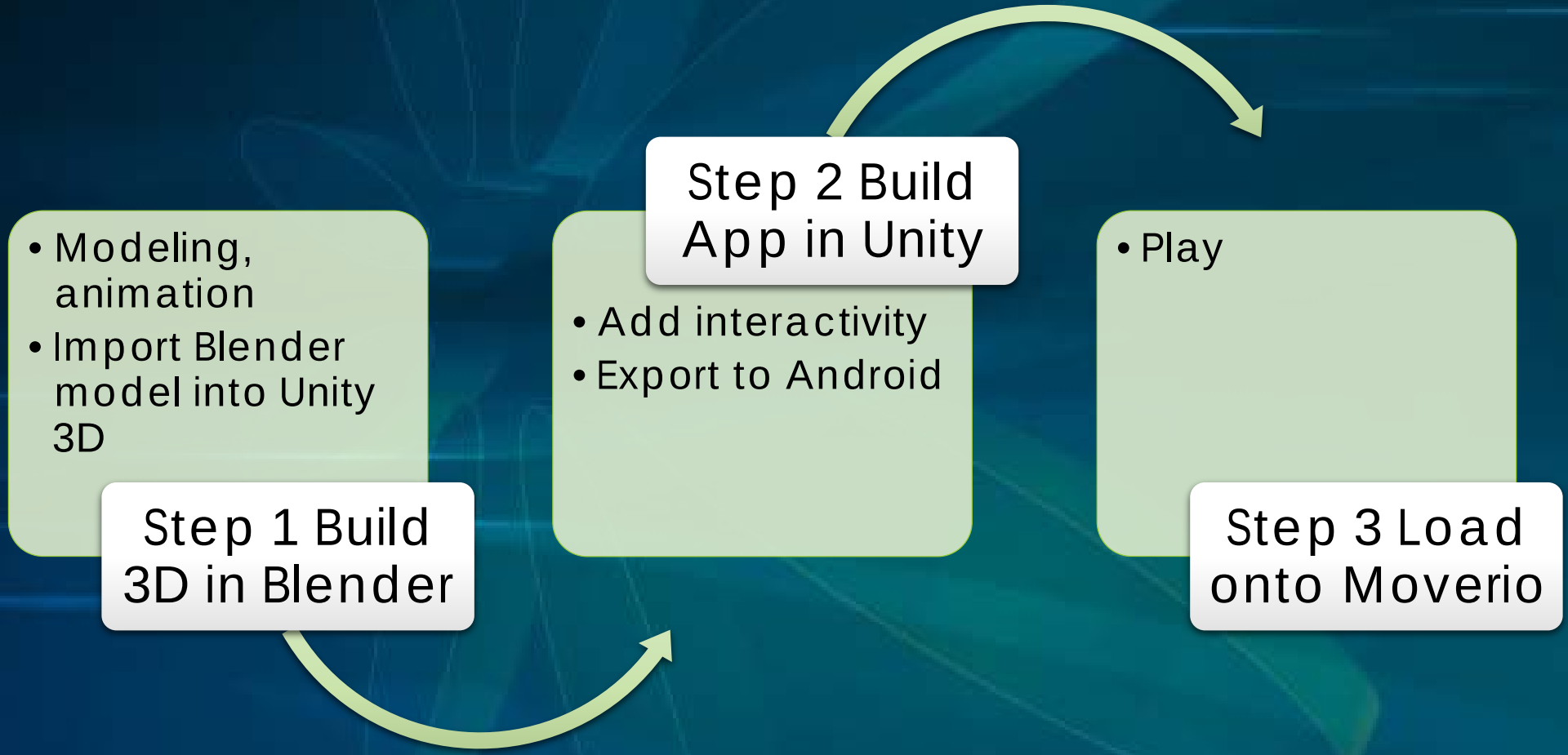


Moverio, Smart Glasses, Augmented Reality with Hardware

- The glasses throw up a 3D model in front of the viewer. It is literally a little "game" that is loaded on to the glasses.
- Follow this link to get a basic overview of how to use Unity 3D, the Android SDK and Vuforia to build apps for the Moverio glasses.

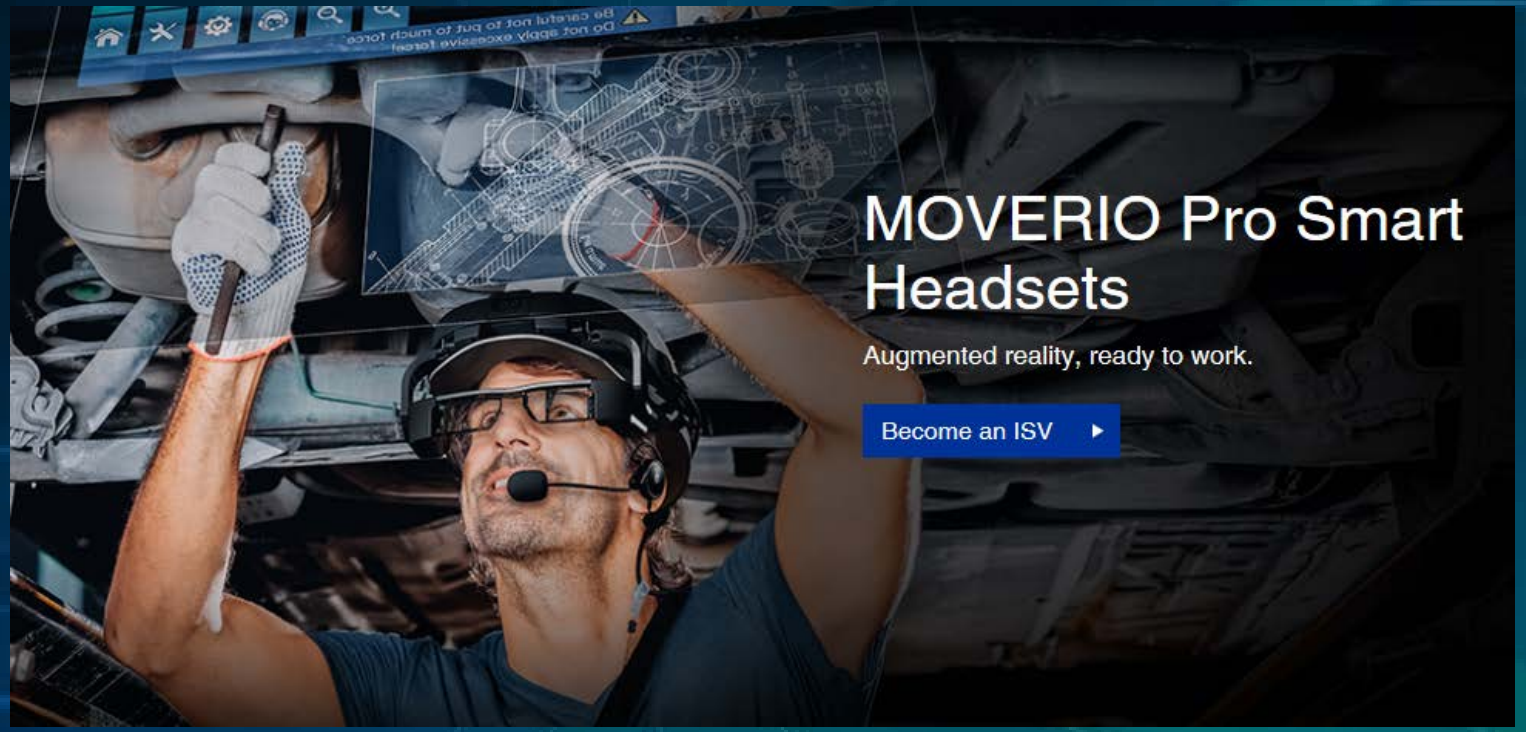
Department of Chemical, Civil, and Mechanical Engineering

Workflow for Moverio



Department of Chemical, Civil,
and Mechanical Engineering

Moverio, for expansion of this research



Ctrl-click the image to the left to see where we think Augmented Reality can take us