Combining Virtual Reality and Engineering for an Exciting Career

Dr. Judy Vance
Jane Peters
Meisha Rosenberg

Iowa State Virtual Reality Application Center

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What is Virtual Reality?

Take a few moments and discuss with your neighbor. Raise your hand when you think you have an answer and are ready to share!
What is Virtual Reality?

- STEREO VIEWING
- POSITION TRACKING

VR is similar to advanced computer simulation, but also involves computer interaction to create an immersive environment.
Animation: Movies
Psychology: Post Traumatic Stress Disorder
What is Engineering?

- Engineering is the discipline of acquiring and applying technical, scientific and mathematical knowledge to design and solve problems.
- Basically.... Engineers are puzzle solvers that get to play with AWESOME tools.
Do You Want to be an Engineer?

• How many of you have parents who are engineers?
• Do any of you already want to be engineers?
How Engineers Help Society…

- They make the world a better place.....
  - Making things more user friendly
  - Making systems more efficient and effective
  - Making everyday tasks safer
  - Help make things GREEN!
Biggest Challenge?

- Who thinks they can name the biggest challenges faced by engineers?
  1. CREATIVITY
  2. COMMUNICATION

- VR HELPS SOLVE THIS PROBLEM!
Virtual Reality in Chemical Engineering
Research

Virtual Reality helps in the visualization of....

Molecular Structures!
Chemical Reactions!
Magnifying Reactions

With the advances in virtual reality, it is now possible to observe chemical reactions that occur synthetically, in nature, and even in the human body on a greatly magnified scale with incredible detail and clarity.
Virtual Reality in Biomedical Engineering
The Magic School Bus

Just like when you were young and imagined traveling through the human body to learn more about how it works, now it is more than just a cartoon, it’s a three dimensional reality.
BodyViz Application

Using VR programs, medical personnel can create 3D images of your body.

Also, the newer images are much easier to read.
Later today, you might get a chance to play with this machine!
Virtual Reality in Agricultural Engineering
Macro to Micro

What does a tractor and plant protein have in common?

StarCAVE by University of California
Virtual Reality in Industrial Engineering
Virtual Reality can allow you to create a model of your assembly line and detect flaws in the manufacturing process before errors on the line cause major costs.

Can you think of a time in your life when you do the same thing?
Virtual Reality in Construction Engineering
Virtual Models of Buildings

Virtual Reality can allow us to create realistic models that can be manipulated in ways that real buildings cannot.

Which one do you think is real?
Virtual Reality can allow an engineer to take a virtual tour of a building months before the construction even begins.
Virtual Reality in Civil Engineering
City Planning

VR allows civil engineers to plan the layout of a city and improve the functionality of the design through various simulations.
VR serves as an excellent training tool as well as a method for modeling environments when planning public transportation systems.
Virtual Reality in Mechanical Engineering
Virtual assembly with collision detection and haptics allows the user to assemble a component and make sure that everything fits together before it is taken to be manufactured.
Haptic devices for virtual reality are all around us.

Look familiar?
Virtual Reality in Aerospace Engineering
Virtual reality allows for safer, more cost effective training for aeronautical engineers and flight crews.
Virtual flight simulations serve as an effective training and diagnostic tool. Also, training in a virtual environment reduces physical risk involved as well as the cost.
Virtual Reality in Software Engineering
Everything you see is based off of the code written and tested by Software Engineers. They develop all of the applications and environments that VR employs.

Software Engineering was declared the second fastest-growing career field with an expected growth rate of 46.07%!
Virtual Reality in Electrical Engineering
Peripheral Devices

External devices, such as haptic gloves are comprised of many different circuits, which are designed by electrical engineers.
Virtual Reality in Computer Engineering
User Interface

Making the hardware and software work together is the computer engineers' job.

They also work to make the user interface manageable and easy to manipulate.
Virtual Reality in YOUR future...
What You Need to Know...

• Virtual Reality is a highly useful and versatile problem solving tool used in many engineering fields.
• You can become involved either as a
  • USER
  • CREATOR  Depending on your interests
  (i.e. “direct interaction” or programming)
• You can get here:
  • Continue to take math, science and computer classes
  • Talk to your guidance counselor about engineering
  • Shadow a student at Iowa State or ask for a tour!
Feel free to contact the Virtual Reality Application Center at Iowa State for more information:

Dr. Judy M. Vance  
http://www.vrac.iastate.edu/  
Mailing address:  
Iowa State University, Virtual Reality Applications Center  
1620 Howe Hall  
Ames, Iowa 50011-2274  
vrac@iastate.edu  
515.294.3092