VR Simulations for Nanotechnology in Teaching and Industry

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MNTESIG COLLABORATION MEETING

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Motivations for Using Virtual Reality

- Efficiency – NO RISK learning for complex equipment
- Effectiveness – Each student learns entire procedure at own pace

Personalized training

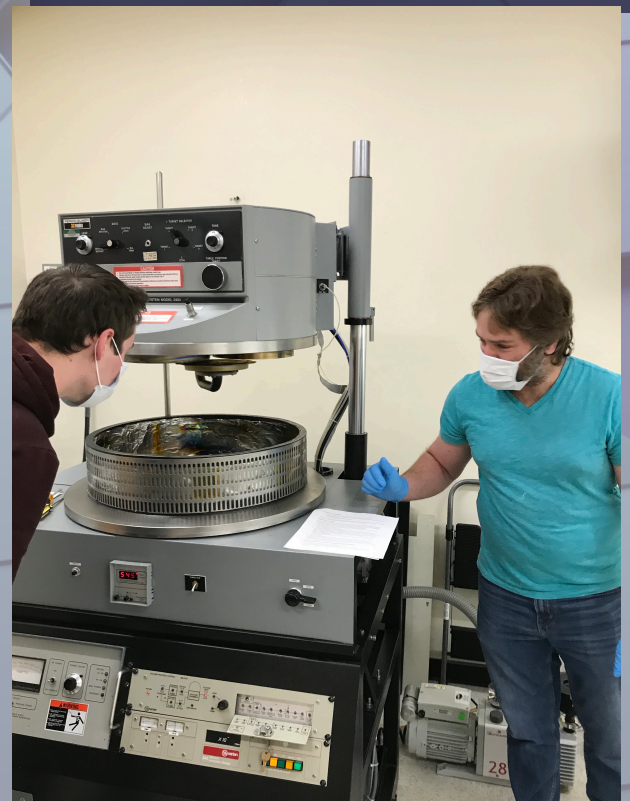
- Deeper learning from “pre-training”

Design Features

- High-fidelity simulations of real equipment
- In-simulation tablet guides, labels on equipment, pop-up menus
- Grading runs, with review of all steps, and mistakes made

Simulations Created

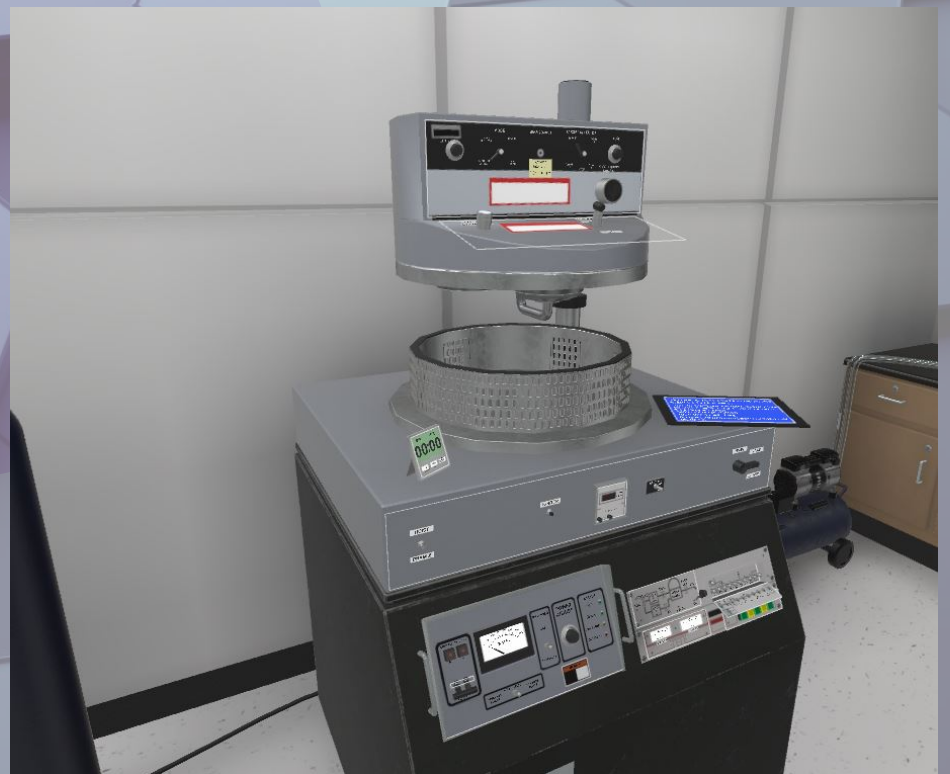
- Vacuum training & sputter deposition
- Scanning electron microscope
- Photolithography
- Atomic force microscope
- Plasma etcher
- Industry simulation – *IM Flash*



Sputtering System

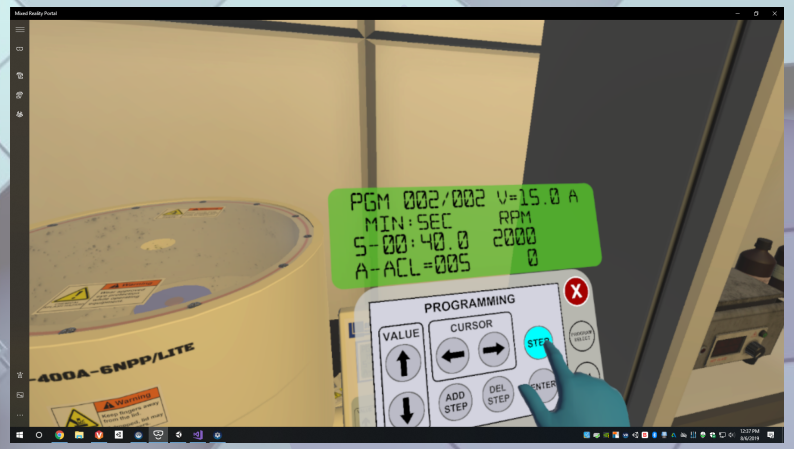
← REAL

VIRTUAL →



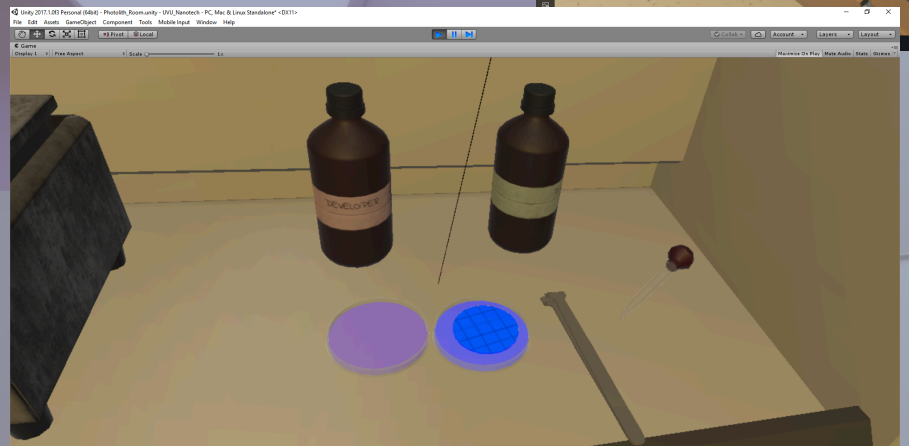
Example - Photolithography

Spin coater



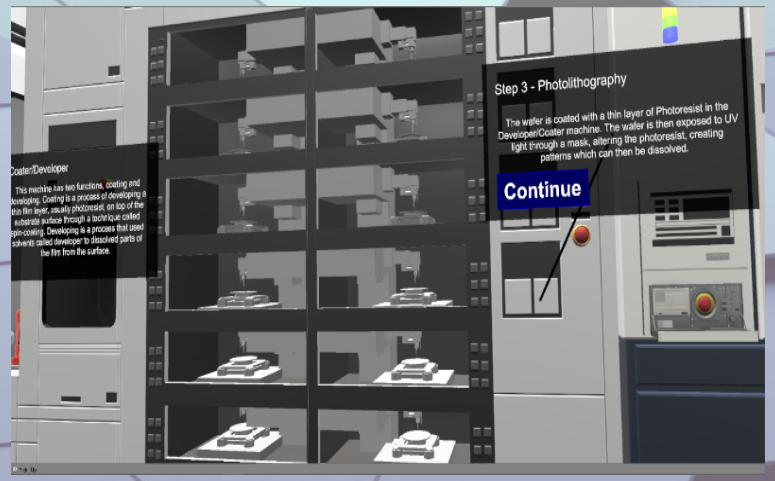
Mask aligner

Score Summary



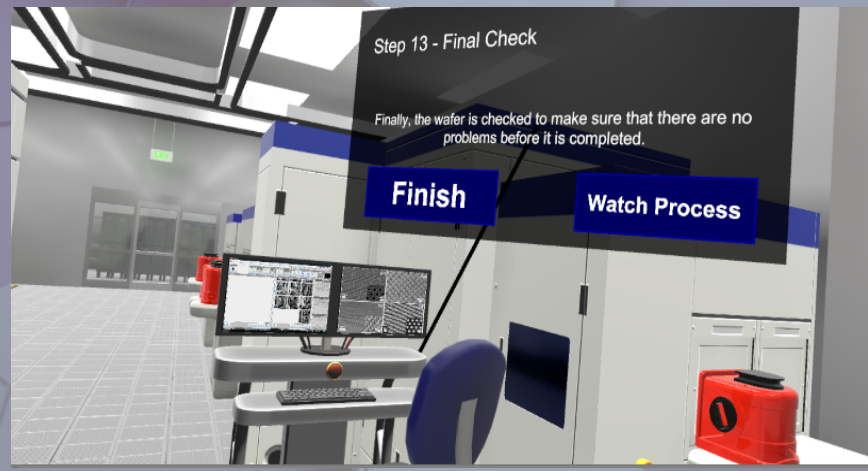
Develop-ment

Improving Collaboration & Ties with Industry



- High-fidelity simulations of real equipment in wafer fabrication
- Training tools for industry, prepared in collaboration with digital media

Some of the steps in an industry grade silicon wafer line of fabrication in virtual reality including coating and exposing, developing, etching, and characterizing.



Conclusion

- Executable modules (“builds”) more info at: uvu.edu/physics/nanotech
- Demonstration of photolithography simulation in HI-TEC virtual conference.
- Workshop on VR design & development at UVU in May, 2021.

Professional development subsidies & stipends available!

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