Carmine Elvezio

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EDUCATION

Columbia University, New York, NY
PhD, Computer Science, June 2021; MPhil, Computer Science, 2021; MS, Computer Science, 2012
Advisor: *Prof. Steven Feiner*, Thesis: *XR Development with the Relay & Responder Pattern*

Polytechnic Institute of New York University, Brooklyn, NY
BS, Computer Science, June 2010 (Summa Cum Laude) NYU-Poly Presidential and Lamelson Scholarships

SELECTED EXPERIENCE (Additional experience listed on my website)

Columbia University (New York, NY) September 2019– June 2021
PhD Student (Advisor: Prof. Steven Feiner)

- Created and studied *XR (AR/VR/MR) and haptic interaction and visualization techniques*
- Conducted experiments across domains including medicine, maintenance, aerospace, and music
- Completed *dissertation* on a new software pattern for XR development, released as open-source project
- Published in *ACM UIST*, *CHI*, and *SUI*, and *IEEE ISMAR*, *VR*, and *IROS*
- Assisted teaching *3D User Interfaces and Augmented Reality* and *Topics in AR/VR*

Computer Graphics & User Interfaces Lab, Columbia University (New York, NY) September 2010–August 2019
XR Research Scientist

- Developed XR systems, calibration tools, and libraries supporting voice/touch input, and hand/eye tracking
- Created numerous *task guidance systems* for XR devices for local and remote collaboration
- Developed *hybrid XR systems* for 3D content exploration and urban data visualization
- Developed XR systems aiding in *complex surgical tasks* and visualizing *ophthalmological* conditions
- Filed patents for *virtual replicas in XR collaboration* and *AR guidance in performing medical procedures*

Columbia Robotics Group, Columbia University (New York, NY) December 2011–June 2012
Research Assistant

- Created UI for control of robotic hands and automated grasp selection using brain control interfaces

ARchemist (New York, NY) November 2011–July 2012
Software Engineer—Server Development

- Created 3D model database, server and web UI, with support for streaming content to mobile devices
- Developed streaming system for compact 3D model transmission over network

SELECTED INDUSTRY PROJECTS (Additional industry projects listed on my website)

DARPA & Columbia - *Cone of Silence* June 2021–September 2021

- Worked on XR privacy system facilitating communication in sensitive environments
- Managed team of interns and researchers in creating technology demos and prototypes

Hakuhodo DY Holdings & Columbia - *AR Volleyball* March 2019–June 2021

- Developed multi-player AR volleyball game supporting integration of reconstructed remote environments
- Managed team of researchers and engineers in creating and delivering prototypes and technical reports

Verizon & Columbia - *Remote Rehabilitation* September 2017–January 2019

- Created VR system enabling remote physical rehabilitation over 5G networks
- Worked onsite with Verizon engineers to create system with feedback and guidance from Verizon management

Naval Sea Systems Command & Columbia - *AR Task Guidance* May 2015–December 2015

- Created automated AR guidance system, and associated calibration tools, for complex assembly tasks
- Managed team to integrate system and calibration suite into proprietary NAVSEA tool chain

SELECTED PUBLICATIONS (Additional publications listed on my website)

Liu, J.-S., Elvezio, C., Tversky, B., & Feiner, S. (2021). Using Multi-Level Precueing to Improve Performance in Path-Following Tasks in Virtual Reality. *2021 IEEE ISMAR 2021*. https://doi.org/10.1109/TVCG.2021.3106476

Krösl, K., Elvezio, C., Luidolt, L. R., Hürbe, M., Karst, S., Feiner, S., & Wimmer, M. (2020). CatARact: Simulating cataracts in augmented reality. *2020 IEEE ISMAR*. https://doi.org/10.1109/ISMAR50242.2020.00098

Elvezio, C., Sukan, M., & Feiner, S. (2018). Mercury: A messaging framework for modular UI components. *2018 ACM CHI*. https://doi.org/10.1145/3173574.3174162. (**GitHub**)

SKILLS

Engines/Graphics Platforms: Unity, Unreal, OpenGL, Vulkan, Direct3D
XR Platforms/APIs: Oculus, Vive, SteamVR, MRTK, HoloLens, Vuforia, ARCore, ARToolkit
Languages: C++, C#, C, GLSL, HLSL, Java, Python, PHP, CUDA, R
OSs: Windows (.NET/COM), macOS, Linux, iOS, Android
Graphics: Multi-core rendering, simulation, GPU, engine development, 3D math (linear algebra, quaternions)
UX and UI design: JavaScript, XAML, HTML, Figma, CSS, Bootstrap