Carmine Elvezio

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I'm a recent doctoral graduate from the *Computer Graphics and User Interfaces Lab* at Columbia University, studying **AR/VR/MR/3D graphics, interactions and visualization techniques**, under Prof. Steven Feiner. I've worked on many projects with academic and industry partners, contributed to several open-source frameworks, advised multiple independent research projects, and have published in *ACM UIST, CHI,* and *SUI,* and *IEEE ISMAR, VR,* and *IROS*. Looking for roles with high impact in the fields of spatial computing, XR, graphics, and HCI.

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, Summa Cum Laude, Graduated June 2010
NYU-Polytechnic Institute Presidential Scholarship, Lamelson Scholarship.

SELECTED EXPERIENCE

Columbia University, New York, NY September 2019– June 2021
PhD Student—Computer Graphics and User Interfaces Lab (Prof. Steven Feiner)

- Studied and developed **XR (AR/VR/MR) and haptic interaction and visualization** techniques, associated applications, and supporting frameworks across several domains including medicine, maintenance, aerospace, music, and rehabilitation, working with technologies including HoloLens 1/2, Oculus, SteamVR, and Unity
- Completed dissertation on a new software pattern facilitating XR development
- Published in *ACM CHI* and *SUI*, and *IEEE ISMAR* and *VR*
- Managed and advised independent student project courses
- Assisted teaching *3D User Interfaces and Augmented Reality* and *Topics in AR/VR*

Columbia University, New York, NY September 2010–August 2019
Research Associate—Computer Graphics and User Interfaces Lab (Prof. Steven Feiner)

- Studied and developed **XR interaction techniques**, associated applications, and supporting frameworks
- Published in *ACM UIST*, *CHI*, and *SUI*, and *IEEE ISMAR, VR,* and *IROS*

SELECTED PROJECTS (Additional projects listed on my website)

Collaborative Exploration of Urban Data in Virtual and Augmented Reality
A *multi-user AR/VR* system for visualizing and interacting with social and municipal urban data

Remote Collaboration in AR and VR using Virtual Replicas
A remote expert in *VR* guides a local tech in *AR* performing equipment maintenance in real-time

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. To appear in *2021 IEEE Trans. Vis. & Comp. Graph. (ISMAR 2021).*

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

OPEN-SOURCE PROJECTS

Mercury Messaging (*https://github.com/ColumbiaCGUI/MercuryMessaging***)**
A framework facilitating XR development through cross-component communication in Unity

GoblinXNA (*http://monet.cs.columbia.edu/projects/goblin/***)**
A platform for research on 3D user interfaces, including mobile AR and VR

PATENT APPLICATIONS

Feiner, S., Loeb, G., Grinshpoon, A., Sadri, S. and Elvezio, C., 2020. Systems and methods for augmented reality guidance. US. Patent Application 16/796,645.

Elvezio, C., Sukan, M., Oda, O., Feiner, S. and Tversky, B., 2016. Systems and methods for providing assistance for manipulating objects using virtual proxies and virtual replicas. US. Patent Application 15/146,764.

SKILLS

Graphics Platforms: Unity, Unreal, OpenGL, Direct3D
XR Platforms/APIs: Oculus, Vive, SteamVR, MRTK, HoloLens, Vuforia, ARCore, ARToolkit
Languages: C, C++, C#, GLSL, HLSL, Java, Python, PHP, CUDA
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
Data Analysis: Python, R