Marco Beccarini

312-709-2813 | San Diego, CA
marco.beccarini@hotmail.it | linkedin.com/in/mbeccarini

WORK EXPERIENCE

Research Software Engineer - Digital Surgery   May 2021 - Present
Surgalign Spine Technologies   *12481 High Bluff Drive, San Diego, CA*

- Developed, optimized and documented full-stack software (C++11 and higher) compliant with ISO standards in Agile environment for Holo Portal, an FDA-approved medical surgical device.
- Conducted software R&D of advanced 3D computer graphics, computer vision, augmented reality (MagicLeap 2 and HoloLens 2), remote rendering, eye/hand tracking, optical tracking, image processing.
- Performed software testing and code reviewing for quality assurance. Contributed to designing, executing and documenting FDA tests and surgical simulations on cadavers.
- Worked on integration of low-latency software and hardware using optical tracking cameras, stereo cameras, 3D projectors, 3D monitors, multi threading, GPUs, thrid-party software and virtual machines.

Graduate Research Assistant   Aug. 2019 - May 2021
University of Illinois at Chicago - Mixed Reality Lab   *1200 West Harrison St. Chicago, IL*

- Designed a sensor fusion surgical guidance technology to automatically detect the distance between the retina and the surgical tool-tips used in minimally invasive microscopic surgery.
- Developed algorithms using OpenCV for camera calibration, disparity map generation, object tracking and image processing.
- Implemented algorithms using the Point Cloud Library (PCL) and the Visualization Library (OpenGL based) for rigid point cloud registration, data visualization and 3D surface conversion.

EDUCATION

University of Illinois at Chicago   Chicago, IL
Master of Science in Biomedical Engineering, GPA 4.0 (Double degree)   *Aug. 2018 – Mar. 2021*
Politecnico di Milano   Milan, Italy
Master of Science in Biomedical Engineering, GPA 4.0 (Double degree)   *Aug. 2018 – Dec. 2020*
Politecnico di Milano   Milan, Italy
Bachelor of Science (Hons) in Biomedical Engineering, GPA 3.8   *Jul. 2015 – Sept. 2018*

RESEARCH AND PROJECTS

A Novel Retinal Proximity Detection System for Ophthalmic Surgical Guidance | **(Thesis)** | (More here)

A deep-learning algorithm for real time intra-operative segmentation | **(Article)** | (More here)

Virtual and Augmented Reality | *C# , Unity* | (Project 1) | (Project 2) | (Project 3)

Haptics projects | *C++ , Visual Studio* | (Projects link)

Descriptions of above and other projects listed on LinkedIn | **(Link)**

OTHER TECHNICAL SKILLS

Languages: C/C++, C#, Python, MATLAB, TeX.
Software: Visual Studio, Unity3D, PyCharm, Android Studio, Git, OptiTrack's Motive, OpenInventor, Azure DevOps, CUDA, OpenCV, VRTK, MRTK, Vuforia
Hardware:Arduino, OptiTrack V120:Trio Camera, Zed Mini, HTC Vive

ACHIEVEMENTS

- Presenter: SMIT Congress 2020, hosted by the *Society for Medical Innovation and Technology.* Best project award. (Presentation Link)

- Presenter: 2021 Annual ARVO meeting. The Association for Research in Vision and Ophthalmology (ARVO) is the largest community of eye and vision researchers in the world. (Link)