

Y I C H E N (A N T H E A) L I

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Education

Boston University, Boston, MA		2014 – 2018
College of Arts and Sciences	<i>Summa Cum Laude</i>	GPA: 3.91 / 4.00
Bachelor of Arts in Economics and Mathematics Joint Degree		Major GPA: 4.00 / 4.00
Bachelor of Science in Computer Science		Major GPA: 3.98 / 4.00
Minor in Business Administration		

Leadership Activities and Honors

• College Prize for Excellence in Computer Science (No.1 Academic Performance)	2018
• Summa Cum Laude	2018
• Boston University Arts Initiative Research Award	2018
• UROP summer Research Award	2018
• Dean's List (All Semesters)	2014 – 2018
• LOCK Honorary Society, <i>Commended Member</i>	Jan 2016 – 2018
• Beta Gamma Sigma Honorary Society (Business top 10%)	Jan 2016 – 2018
• Delta Kappa Alpha, National Professional Cinematic Fraternity	Sept 2014 – 2018

Work and Research Experiences

Boston University CS Department • shape.bu.edu *Researcher* Sept 2017 – Present

- Program in Unity3d and Java to analyze and visualize 3D model stability as well as provide various stabilization solutions as ready to be 3d-printed meshes and collaborate with research PI
- Use ARKit and Google Tango to achieve real-time 3d model auto-recognition and visualization with stability analysis in augmented space
- Create mobile apps in Swift and Android Studio for iOS and Android platforms to provide museums with convenient stability analysis and stabilization solutions

Spark! Lab, Boston, MA *Developer and Programming Consultant* Sept 2017 – May 2018

- Develop the Diet, News Feed, and Catalog functionalities in Java/Android Studio Collaborate in a team of five to build an app for the Health and Fitness company Global Joy
- Hold weekly meetings with clients and designed new development strategies to satisfy new customer needs in an agile development environment
- Work on a machine learning supply demand matching algorithm in a team of three to optimize the matching between health coach and customer

Revlon, London, U.K. *Financial Analyst Intern* June 2017 – August 2017

- Use SVM and etc. machine learning algorithms to perform financial analysis on periodic weekly sales data with respect to time, location, SKUS, brand launches, and seasonal factors to provide insights for the finance and retail team
- Use Python and other data mining tools to analyze the macro market and seasonal industrial trends with historical data provided to strategize for future marketing, branding, and product innovation efforts

Skills

Software Engineering: Python, Haskell, Java, Ruby, C#, C++, C, Objective-C, Swift, Android

Computer Graphics/Vision and AR/VR: Unity3D, ARKit, ARCore, Tango, Simmetri, OpenCV

Data Analytics: STATA IC, Pandas, R, Matlab, MongoDB, Bloomberg, and Microsoft Office

Publications

• Plummer, Bryan., Shih, Kevin., Li, Yichen., Lazebnik, Svetlana., , Xu, Ke., Saenko, Kate., Sclaroff, Stan., 2018. Open-vocabulary Phrase detection. In proceedings of CVPR.

Abstract: Most existing work that grounds natural language phrases in images starts with the assumption that the phrase in question is relevant to the image, limiting their potential applications. In this paper we address a more open and practical version of the natural language grounding task where we must both localize and identify if the phrase is relevant to an image. This is more akin to the standard object detection task and can be evaluated in the same way. Our approach to this task uses a Faster R-CNN-style network that has been adapted to relate image regions and phrases. By carefully initializing the classification layers of our network using canonical correlation analysis (CCA), we encourage a solution that is more discerning when reasoning between similar phrases, resulting in over double the performance compared to a naive adaptation. We evaluate our approach on two popular phrase grounding datasets: Flickr30K Entities and ReferIt Game.

• Li, Yichen., Whiting, Emily., Ochsendorf, John., 2019. Augmented Reality 3D Sculpture Retrofit Stabilization. In submission to the ACM SIGGRAPH.

Abstract: Existing techniques for stability analysis and stabilization solutions for priceless art pieces or historical artifacts require complicated hardware setup and time-consuming support design process. In this paper, we present a novel approach to objects stabilization by integrating Augmented Reality (AR) technology in the traditional stabilization pipeline. Our model solves the 3D model stabilization problem by utilizing AR-enabled real-time photogrammetry to obtain a 3D mesh of the object. Based on the reconstruction, we conduct a stability analysis in real-time to be visualized using AR for users to set their preference on the retrofitting mesh to be designed and generated. Our model constructs a support structure in real-time subjected to user-specified preferences on the minimum tipping angle, maximum amount of support material used and so on. Finally, our model will generate a properly-scaled mesh ready to be 3D printed and attached to the sculpture or model in question for added stability. We demonstrate that the 3D-printed support structure generated by our model provides the same amount of stability as the existing efforts in sculpture and model stabilization but is a lot faster, less costly, and more convenient than the state-of-the-art system.

Related Projects and Course Work

Color and Material Augmented Photometric 3D Reconstruction: this project aims to improve the real-time photogrammetry precisions of monochrome objects, especially for the sculptures made of clay or marble. The model does so by sampling physical properties of objects including dimension, material, and color to supervise the reconstruction process. The first step involves a depth-noise-filtered voxelization of an AR-enabled bounding frustum by combining both surface and color detection misses. The reconstruction precision is further improved with a color-and-material-consistency-augmented shadow carving process. The model will iteratively apply adjustment on the voxel created in the first step from different angles. It uses a set of pre-learned, material-specific properties to minimize the disparity between the re-projection of the reconstructed model in constant color texture wrapper and the actual photo taken. The procedure uses the presumption that the geometry to reconstruct is of one single color and by using one pre-produced constant colored texture, it manipulate the mesh to approximate the ground truth one.

Course Work: Computer Graphics, Algorithms, Geometric Algorithms, Data Structures, Machine Learning, Software Engineering, Application Development, Linear Algebra, Probability Theory, Applied Statistics, Optimization Methods for Research

Other Skills

Media Production and Other: Avid Media Composer, Adobe Creative Suite, Autodesk 3Ds Max,

Language Skills: Bilingual proficiency in Mandarin Chinese, Conversational proficiency in French