Karl Toby Rosenberg

Mailing Address:
60 Fifth Avenue, 3rd Floor, Office 342
New York University, New York NY, 10011 USA

E-mail: karltobyrosenberg@nyu.edu
Phone: 347-598-7068
https://github.com/KTRosenberg

RESEARCH INTERESTS:

I prototype the future of language. My goal is to improve the communication of ideas by extending our range of creative expression during face-to-face conversations. I explore how to blend technology with social interactions.

EDUCATION:

New York University, New York, NY
9/2018-5/2022: PhD – Computer Science – Advisor: Dr. Ken Perlin – Research Area: Human Computer Interaction
GPA: 3.852
5/2017: Bachelor's – Computer Science Major, German Minor
GPA: 3.969 *summa cum laude*
Honors and Affiliations:

Phi Beta Kappa Honors Society, Undergrad Humanities Fellow, CS Prize for Academic Excellence Recipient

Relevant Courses:

Data Structures, Algorithms, Graphics, Multi-Core Programming, NLP, Computer Systems, Networks

PUBLICATIONS:

[1] Zhenyi He, **Karl Toby Rosenberg**, Ken Perlin. 2019. Exploring Configuration of Mixed Reality Spaces for Communication. To appear in *Proceedings of the 2019 CHI Conference Extended Abstracts on Human Factors in Computing Systems* (CHI EA '19). ACM, New York, NY.
[2] Ken Perlin, Zhenyi He, **Karl Rosenberg**. Chalktalk : A Visualization and Communication Language -- As a Tool in the Domain of Computer Science Education. *SPLASH LIVE Programming Workshop 2018*. Boston MA. arXiv:1809.07166. *https://arxiv.org/abs/1809.07166*

EXPERIENCE AND RESEARCH PROJECTS:

2/2017-present: **Researcher**, **NYU Future Reality Lab**, New York, NY

- Key collaborator on Chalktalk: a tool for live presentation, and communication – users' drawings are recognized as 3D animated interactive sketches to illustrate ideas *https://github.com/kenperlin/chalktalk*
- ChalktalkVR: an extension of Chalktalk into a multi-user VR system exploring collaboration and face-to-face communication. Features multiple perspective views on content and users. ChalktalkVR was published as a Late Breaking Work at SIGCHI 2019 **[1]** and demoed at Oculus Connect 6.
- MetaRoom: a WebVR platform in which multiple users can experience and travel between 3D worlds together in a shared physical 1-to-1 space. Worlds can be modified at runtime using connected devices.

11/2017-9/2018: **Lead Programmer (Project and Graphics), Solomon R. Guggenheim Foundation**, New York, NY

- 5/2017: Completed research internship in software artwork conservation, prototyped migration of piece
- 9/2018: Programmed full restoration and renderer for the piece *Unfolding Object* by John F. Simon Jr.

6/2016-12/2016: **Computer Science Course Tutor, New York University Courant Institute**; New York, NY

- Tutored for Data Structures, two sections of Introduction to Programming in Python
- Reinforced concepts in data structures, algorithms, problem-solving, and debugging

PERSONAL PROJECTS:

3/2018-present: **Custom Game Engine and Drawing API: RotoLogic** and **StratoDraw**, *written in C++*:

- Developing a 2D game engine, in-game visual editor (RotoLogic), and renderer (StratoDraw) from scratch to experiment with graphics
- RotoLogic: supports in-game collision detection editing, live configuration, dynamic audio tracks
- StratoDraw: high-level renderer (currently OpenGL) for drawing layered shapes and parallax-scrolling backgrounds in re-orderable batches, supports hot reloading for quick iteration in a coding playground

11/2017-3/2018: **Projection Draw**, *VR prototype in Unity*:

- real-time drawings are projected onto the world or proxy objects based on the user's perspective view– *https://drive.google.com/file/d/1z8r95IVryHpYrBtj2dnfLj87Fbq39tWO/view?usp=sharing*

PROGRAMMING, SOFTWARE:

Languages and Tools:
C, C++, Java, C#, Python, JavaScript,
Bash, Git, Unity, OpenGL, WebGL, GLSL

Non-Programming:
Steinberg Cubase,
Adobe Photoshop and Illustrator

ADDITIONAL INTERESTS:

- *Music*: composition and production of original works; MIDI and audio editing
  - *https://soundcloud.com/synchronizerman*
- *Language*: German (intermediate) – spoken, written, translation
- *Artwork*: concept drawings, game maps, logos; pencil, computer-aided