

Roya Shams-Zadeh-Amiri

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Education

University of Toronto, St. George
Toronto, ON (2015–Present),
(H.B.Sc) Computer Science Specialist

Bayview Secondary School
Richmond Hill, ON (2011–2015)
International Baccalaureate (IB) Diploma

Relevant Coursework

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|------------------------------------|---|--|
| • Introduction to Visual Computing | • Software Tools and Systems Programming | • Introduction to Databases |
| • Computer Graphics | • Web Development | • Algorithm Design, Analysis, and Complexity |
| • Operating Systems | • Design of Interactive Computational Media | |
| • Software Design | | |

Skills

- **Languages:** Python, Java, Verilog, C, C++, SQL and self-taught knowledge of HTML, CSS, and JavaScript.
- **Frameworks and Libraries:** p5.js, JQuery, Ajax, OpenCV, Django, NumPy, OpenGL
- **Git and Version Control** for collaborative work, 3 years of experience
- **OSX and Linux** based desktop platforms, 3 years of experience
- Additional knowledge of **Graphic Design** with Adobe Photoshop

Experience

- **Alpha Coach for Hatch Canada (Current)**
 - » Classroom instructor for afterschool program towards students aged 7–17, assists students with personal projects using the python console
 - » Patient with explaining programming concepts at accommodating levels.
 - » Adapts to each student's needs and experience, as well as their interests and what projects motivate them.
 - » Generates enthusiasm for programming, building, and creating within younger students
- **Toronto ACM SIGGRAPH Chapter Executive Member (Current)**
 - » Publicizes upcoming events, resources, and developments in the field of computer graphics, emphasis within Toronto.
 - » Coordinates on a weekly basis with rest of chapter using conference calls or in person meetings to keep track of any updates that need to be reflected in public material

Projects

- **Personal Site: www.royashams.com (HTML, CSS, and JavaScript, self-taught) (Jul. 2017)**
 - » Designed all involved graphic components using Adobe Photoshop.
 - » Navigation diamond created using an iterative design process tested on multiple users to observe intuitiveness of use.
 - » Steps in this process-included prototyping, testing, observing user feedback to create a better design for user interaction.
 - » Key refinements made through observation of user interaction include adding flashing arrow buttons, and implementing visual cues using hover capabilities over the diamond.

- **Snackerman:** royashams.pythonanywhere.com (Django/Python)(Dec. 2017)
 - » Web app allowing users to find, bookmark, and review food places on the University of Toronto Campus, directed towards students and faculty
 - » Collaborated with 3 students, using and extending the cobalt.qas.im API
 - » Implemented back-end HTTP routing methods to our RESTful API, and created django.db databases for storing, updating, and deleting messages and reviews to the server

Course Projects in Computer Graphics

★ Note: These projects were completed while taking courses at the University of Toronto, and I am unable to provide a link to my projects. I am able to demo these projects, if requested.

» 2D Computer Graphics

- Visual Computing or Image Processing (All completed in NumPy and OpenCv)
- Triangulation Matting ([“Blue Screen Matting”, Smith & Blinn, 1996](#))
 - » Computes alpha and color values of a foreground object from 2 sets of images containing a foreground object and a background, and images with the removed foreground object.
 - » Computed alpha and color values by implementing Theorem 4 Described in the paper, and can composite final images given foreground and a new background.
- Image Inpainting ([“Exemplar-Based Image Inpainting”, Criminisi et al. 2004](#))
 - » Removes large gaps from digital images using background patches that detect strong, similar edges, and fills the remaining area using this information.
 - » Computed gradients, curve normals, and confidence values given an image patch.
- PatchMatch ([“PatchMatch: A Randomized Correspondence...” Barnes et al. 2009](#))
 - » Reconstructs a target image from a source image by iteratively improving a Nearest-Neighbor Field, using either adjacent or random pixel offsets.
 - » Implemented propagation and random search methods described in Section 3.2 of the paper, by taking offset pixels that have a minimum difference in intensity from the source and target images.

» 3D Computer Graphics

- Shaders in OpenGL
 - » Implemented ambient, diffuse, and specular components of Phong and Gouraud photorealistic shading models, as vertex or fragment shaders
 - » Modified these models to obtain stylistic results, such as cel shading, halftone shading, and shading that shows translucency (“x-ray shading”)
- Ray tracing in C++
 - » Collaboration with a partner on implementing a basic ray tracer that can compute intersections and render spheres and planes
 - » Computes shadows and recursively bounce rays off of objects to produce reflections
 - » Additionally implemented anti-aliasing using normal sampling, simulated depth of field following the thin-lens model.

Extracurricular

- Vice President of University of Toronto Computer Graphics club (UTCg) (Current)
- SIGGRAPH 2017 Student Volunteer in Los Angeles (Aug. 2017)
- Computer Science Student Union Office Operations (Current)
- Hart House Singers – Choir Member (2016-2017)
- Independent photographer, musician, designer, sculptor, and crafter.

Additional links and Portfolios

All portfolio content can be found on my personal website: <https://royashams.github.io/portfolio.html>