

# DIYANG ZHANG

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## Education

### Dartmouth College

*M.S in Computer Science with concentration in Digital Arts*

**Hanover, NH, U.S.**

*2022 - 2024 (Expected)*

### McGill University

*B.S with First-Class Honors in Mathematics and Computer Science*

**Montreal, QC, Canada**

*2017 - 2021*

### University of California, Berkeley

*Exchange program with a focus on Computer Science*

**Berkeley, CA, U.S.**

*Summer 2016*

## Relevant Coursework

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|-------------------------|----------------------|--------------------|---------------------------------|
| • Computer Graphics     | • Computer Vision    | • Machine Learning | • Physically-Based Animation    |
| • Differential Geometry | • Numerical Analysis | • Advanced Algebra | • Partial Differential Equation |

## Publication

### Fluid Simulation on Neural Flow Maps

*ACM Transactions on Graphics (Siggraph Asia 2023) (Accepted)*

## Research Experience

### Research Assistant, Dartmouth College, VCL

**Hanover, NH, U.S.**

*Turbulent fluid mechanics and vortex dynamics simulation. Advisor: Prof. Bo Zhu*

*Sep. 2022 - present*

- Assemble neural representation into conventional physical simulation pipeline for more intricate fluid phenomena and more challenging simulation scenarios.
- Devised grid-based algorithm that accurately simulated the intricate vortex behavior in smoke and water simulations, achieving physical accuracy while preserving the fluid's visual details.
- Investigated the *Clebsch* representation of complex fluid flow using a hybrid vortex particle-grid approach, aimed for a simplified implementation that achieved comparable accuracy while requiring lower-level physics proficiency.

### Honors Research Project, McGill University, Math Department

**Montreal, QC, Canada**

*Fourier spectral method for fire and smoke simulation. Advisor: Prof. Jean-Christophe Nave*

*Fall 2021*

- Implemented numerical method for fire and smoke simulation that utilized Fourier spectral approximations of the Navier-Stokes equations, resulting in highly realistic simulations that achieved computational efficiency.
- Applied volume penalization approach to effectively incorporate obstacles and flame sources into fluid simulations, handling boundary conditions with high-level physical accuracy.

### Visiting Student Researcher, Tsinghua University, School of Software

**Beijing, China**

*Deep learning with weak annotation for practical detection purpose. Advisor: Prof. Guiguang Ding*

*Summers 2020 and 2021*

- Conducted extensive experimentation and fine-tuning of object detection models for recognizing brain disorders using diagnostic reports, for highly effective and efficient diagnostic software tools for real-world medical applications.
- Designed an interactive diagnostic software for usage in clinical practice to improve the accuracy and efficiency of radiologists in different hospitals, based on the accuracy and generalisability of our models.

### Honors Research Project, McGill University, CS Department

**Montreal, QC, Canada**

*Review of Advection-Reflection Fluid Solver. Advisor: Prof. Paul Kry*

*Fall 2020*

- Replicated the algorithm and render the simulation result of smoke plume coupling with solid obstacles using second-order advection-reflection solver.
- Evaluated and compared the level of detail-preservation by implementing a variety of other classical fluid solvers that previously employed by convention.

## Projects

### DARTS | CS287, Dartmouth College | C++

*Fall 2022*

- Implemented a Monte Carlo ray tracer with highlighted advanced features for photo-realistic rendering, including photon mapping and volumetric path tracing for both homogeneous and heterogeneous media, with support of coloring.
- Expanded the capabilities of our framework by incorporating other features such as microfacet anisotropic BRDF, environment map with importance sampling, directional light, and depth-of-field camera.

### Collections of Mini Simulation Projects | Comp557&559, McGill University | Java

*Fall 2019, Winter 2020*

- Completed a series of mini projects focused on computer graphics and physically-based animation, including the implementation of a collision system, finite-element fracture simulation, geodesics in heat and rigid body transformations.

## Honors & Awards

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Master Scholarship | *Dartmouth College*

*Sep.2022 - present*

First-Class Honors in Mathematics and Computer Science | *McGill University*

*Feb. 2022*

## Professional Experience

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**Nari-Relays Electric, Co., Ltd.**

**Nanjing, China**

*Software Developer Intern*

*Summer 2019*

- Redesigned the graphic user interface of data monitoring software in C++ with Qt tools.
- Developed API for seamlessly loading reports into the administration system from xml and json files in real-time.

**WangpuData Tech Inc.**

**Nanjing, China**

*Software Developer Intern*

*Summer 2018*

- Implemented a real-time web scraping tool in Python to extract micro-blogs from selected verified public users.
- Devised a WeChat mini program which automatically gathered trending news about a chosen topic from official accounts.

## Technical Skills

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**Languages:** C/C++, Java, Python, Matlab, Taichi

**Developer Tools:** Visual Studio, Eclipse, PyCharm, Git

**Software:** Maya, Blender, Houdini

**Frameworks and API:** OpenGL, OpenCV, Pytorch, Sklearn, Eigen, Qt

## Teaching Experience

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Teaching Assistant | *CS77 Computer Graphics* | *Dartmouth College*

*Winter 2023*

## Certification

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Diplôme d'études en langue française (DELF) B2

*permenant*