

NICHOLAS SHARP

nsharp@cs.cmu.edu | www.nmwsharp.com |  nmwsharp |  google scholar

Education

Carnegie Mellon University · MS & PhD in Computer Science

ADVISOR: KEENAN CRANE

- Topics: geometry processing, computer graphics & vision, geometric learning

Pittsburgh, PA

Fall 2019, Spring 2021 (*expected*)

Virginia Tech · BS in Engineering Physics, Computer Science, Mathematics

TRIPLE MAJOR, *IN HONORS*

- Minors in Physics and Statistics

Blacksburg, VA

Spring 2015

Work Experience

Carnegie Mellon University

GRADUATE RESEARCHER

Pittsburgh, PA

Aug 2015 - *ongoing*

Oculus Research / Facebook Reality Labs

RESEARCH INTERN

Mentor: Alexander Fix. Designed and implemented a new system for learned appearance modeling in 3D reconstructions using differentiable rendering.

Redmond, WA

Fall 2018

Oculus Research / Facebook Reality Labs

RESEARCH INTERN

Mentor: Takaaki Shiratori. Developed an algorithm for temporal correspondence in scan geometry. Created artist tools to process scan data.

Pittsburgh, PA

Summer 2016

Oculus Research / Facebook Reality Labs

RESEARCH INTERN

Mentor: Yaser Sheikh. Prototyped a multicamera reconstruction system, including hardware, software, calibration, and processing pipeline.

Pittsburgh, PA

Summer 2015

Microsoft Silicon Valley

SOFTWARE DEVELOPMENT INTERN

Mountain View, CA

Summer 2013

Lawrence Livermore National Lab

HIGH ENERGY DENSITY PHYSICS INTERN

Integrated new visualizations into a massively parallel multiphysics codebase. Utilized some of the nation's most powerful supercomputers.

Livermore, CA

Summer 2012

Johns Hopkins University Applied Physics Lab

NASA RESEARCH INTERN

Mentor: Mikhail Sitnov. Developed an empirical computer model of the terrestrial magnetosphere synthesizing first-principle techniques and data analytics.

Laurel, MD

Summer 2011

Publications

- [8] **You Can Find Geodesic Paths in Triangle Meshes by Just Flipping Edges**
Nicholas Sharp and Keenan Crane
ACM TRANSACTIONS ON GRAPHICS (SIGGRAPH ASIA) 39 (6) 2020
- [7] **A Laplacian for Nonmanifold Triangle Meshes**
Nicholas Sharp and Keenan Crane
SYMPOSIUM ON GEOMETRY PROCESSING (SGP) 2020 - **BEST STUDENT PAPER AWARD**
- [6] **PointTriNet: Learned Triangulation of 3D Point Sets**
Nicholas Sharp and Maks Ovsjanikov
EUROPEAN CONFERENCE ON COMPUTER VISION (ECCV) 2020
- [5] **Navigating Intrinsic Triangulations**
Nicholas Sharp, Yousuf Soliman, and Keenan Crane
ACM TRANSACTIONS ON GRAPHICS (SIGGRAPH) 38 (4) 2019
- [4] **The Vector Heat Method**
Nicholas Sharp, Yousuf Soliman, and Keenan Crane
ACM TRANSACTIONS ON GRAPHICS (SIGGRAPH) 38 (4) 2019
- [3] **Variational Surface Cutting**
Nicholas Sharp and Keenan Crane
ACM TRANSACTIONS ON GRAPHICS (SIGGRAPH) 37 (4) 2018
- [2] **Pathways on Demand: Automated Reconstruction of Human Signaling Networks**
Anna Ritz, Christopher L Poirel, Allison N Tegge, Nicholas Sharp, Kelsey Simmons, Allison Powell, Shiv D Kale, and TM Murali
NPJ SYSTEMS BIOLOGY AND APPLICATIONS 2016
- [1] **Xtalk: A Path-Based Approach for Identifying Crosstalk Between Signaling Pathways**
Allison N Tegge, Nicholas Sharp, and TM Murali
BIOINFORMATICS, 2016

Software

Additionally, open-source code is available for all publications above at <https://github.com/nmwsharp/>.

Polyscope

Easy 3D visualization of meshes, point clouds, etc. in C++ & Python. Enables engineers, artists, and researchers to create useful, interactive visualizations with < 5 lines of code.

[polyscope.run](#)

geometry-central

A modern C++ library of data structures and algorithms for geometry processing, with a particular focus on surface meshes.

[geometry-central.net](#)

hapPLY

A header-only C++ reader/writer for .ply file format. Parse .ply happily!

[github.com/nmwsharp/happly](#)

Awards

- 2020 **Best Paper Award (student paper)** Symposium on Geometry Processing 2020
- 2016 **NSF Graduate Research Fellowship**
- 2015 **Best Project Pitch** CMU Graphics Seminar
- 2015 **Finalist** CRA Undergraduate Researcher Award
- 2015 **World Finalist** ACM ICPC Competitive Programming Contest in Marrakech, Morocco
- 2014 **World Finalist** ACM ICPC Competitive Programming Contest in Ekaterinburg, Russia
- 2014 **Meritorious Winner** Mathematical Contest in Modeling

Talks

- Intrinsic Triangulations in Geometry Processing**
GAMES SEMINAR
China (virtual)
Mar 2021
- Robustness in Geometry Processing: from Laplacians to Learning**
NVIDIA AI
Toronto, ON (virtual)
Feb 2021
- Intrinsic Triangulations in Geometry Processing**
GEOMETRIC COMPUTATION GROUP, STANFORD
Stanford, CA (virtual)
Nov 2020
- Intrinsic Triangulations in Geometry Processing**
ADOBE RESEARCH
San Jose, CA (virtual)
Nov 2020
- Intrinsic Triangulations in Geometry Processing**
TORONTO GEOMETRY COLLOQUIUM
Toronto, ON (virtual)
Oct 2020
- A Laplacian for Nonmanifold Triangle Meshes**
SGP 2020
Utrecht, NL (virtual)
July 2020
- Geometric Computing with geometry-central**
SGP 2020 GRADUATE SCHOOL
Utrecht, NL (virtual)
July 2020
- Robust Geometry Processing and Nonmanifold Laplacians**
GRAPHICS SEMINAR, MIT
Cambridge, MA (virtual)
July 2020
- Intrinsic Triangulations in Geometry Processing**
STREAM GROUP, LIX, ÉCOLE POLYTECHNIQUE
Paris, France
Oct 2019
- Navigating Intrinsic Triangulations**
SIGGRAPH 2019
Los Angeles, CA
Aug 2019
- The Vector Heat Method**
SIGGRAPH 2019
Los Angeles, CA
Aug 2019
- Variational Surface Cutting**
IST AUSTRIA
Klosterneuburg, Austria
June 2018

Variational Surface Cutting
SIGGRAPH 2018

Vancouver, BC
Aug 2018

Machine Learning Models for Terrestrial Space Weather Forecasting
SIAM ANNUAL MEETING

Chicago, IL
July 2014

Optimal Control in Time-Varying Velocity Fields using Alpha Hulls
SIAM ANNUAL MEETING

Chicago, IL
July 2014

Service

Reviewer SIGGRAPH (2020, 2021), Eurographics (2018,2019), CGTA (2019), Graphics Interface (2020), Eurographics Short Papers (2020), Pacific Graphics (2020), Computers and Graphics (2021)

Teaching Graduate TA at CMU
15-462 Computer Graphics
15-869 Discrete Differential Geometry

Departmental Student Member, Doctoral Review Committee
Organizer, PhD Admissions Open House
Organizer, Random Distance Run

Mentor CMU Graduate Application Support Program for underrepresented applicants

Problem Author ACM Inter-Collegiate Programming Contest (ICPC), 2017 & 2018

Organizer Virginia High School Programming Contest, 2015

Skills

Programming C++, Python, Java, \LaTeX , MATLAB

Technologies PyTorch, OpenGL, Eigen, CMake

Tools Unix/Linux, VIM, Blender, Adobe Illustrator & Photoshop

Personal

Cooking www.nmwsharp.com/recipes

Baking ciabatta, focaccia, pretzels, sourdough

Long Distance Running 2014 Hokie Half, 2017 Baltimore Marathon, 2019 Pittsburgh Half