

NICHOLAS SHARP

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Education

Carnegie Mellon University · PhD in Computer Science

ADVISOR: KEENAN CRANE

- Topics: geometry processing, numerical computing, computer graphics & vision

Pittsburgh, PA

Aug 2015 - May 2021 (expected)

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

TRIPLE MAJOR, IN HONORS

- Minors in Physics and Statistics

Blacksburg, VA

Aug 2010 - May 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

Navigating Intrinsic Triangulations

Nicholas Sharp, Yousuf Soliman, and Keenan Crane
ACM TRANSACTIONS ON GRAPHICS 38 (4) 2019

The Vector Heat Method

Nicholas Sharp, Yousuf Soliman, and Keenan Crane
ACM TRANSACTIONS ON GRAPHICS 38 (4) 2019

Variational Surface Cutting

Nicholas Sharp and Keenan Crane
ACM TRANSACTIONS ON GRAPHICS 37 (4) 2018

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

Xtalk: A Path-Based Approach for Identifying Crosstalk Between Signaling Pathways

Allison N Tegge, Nicholas Sharp, and TM Murali
BIOINFORMATICS, 2016

Software

Polyscope

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

github.com/nmwsharp/polyscope

geometry-central

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

github.com/nmwsharp/geometry-central

Navigating Intrinsic Triangulations

Code release for [Sharp et. al. 2019]. Offers black-box robust geometry processing for existing algorithms via a simple data structure.

github.com/nmwsharp/navigating-intrinsic-triangulations-demo

hapPLY

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

github.com/nmwsharp/happly

Awards

2016 **NSF Graduate Research Fellowship**

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
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, Canada
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 Eurographics, CGTA

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

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

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 peasant bread, focaccia, pretzels

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