

# Zahra Forootaninia

Git repositories: [https://bitbucket.org/Zahra\\_fn](https://bitbucket.org/Zahra_fn)  
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## RESEARCH & WORK EXPERIENCE

**Summer Intern** Jet Propulsion Laboratory, May 2019 - October 2019  
**R&D FX and Simulation Intern** DreamWorks Animation, May - December 2018

### Graduate Research Assistant

- **Physics based animation:** University of Minnesota, June 2016 - present  
Working on numerical optimization techniques for physics-based animation problems. I implemented crowd simulation based on collision avoidance approach for multi-agent navigation and planning. Recently, I submitted a frequency domain smoke guiding method for animation purposes for SIGGRAPH 2020 (**C++, Python, Matlab**)  
**publication:** "Uncertainty Models for TTC-Based Collision Avoidance" Robotics Science and Systems, MIT, Massachusetts, USA, 2017.
- **Radio luminosity function and galaxy evolution:** University of Minnesota, Spring 2012 - 2014  
Using the Very Large Array (VLA) radio telescope to acquire data for a large cluster of galaxies (Abell 2256). Using this data I created images and a catalog of galaxies and performed statistical analysis on the data in order to determine the dynamical properties of the cluster. (**Python, Numpy, CASA, BigData**)

**Software developer Intern at Infinite Campus, Inc** June - December 2015  
Porting part of a Couchbase backed Student Information System (SIS) web app from Ruby to Grails and wrote Spock unit tests. (**Java, Ruby, Grails, Spock, Tomcat Server**)

## SKILLS

**Technical:** Crowd simulation, Physics Based Rendering Techniques (PBRT), SPH simulation, Ray casting, Image processing, Computer vision, Statistical analysis, Mathematical modeling.  
**High Level Languages:** C++, Python, Java, MATLAB, Groovy, Grails, Ruby  
**Specialized Tools:** Blender, OpenGL, Maya, R, SQL, 2, Tomcat Server, CASA, LaTeX, Mathematica  
**Operating System:** Unix/Linux, Mac OS X, Windows

## TEACHING EXPERIENCE

**Elementary Computational Linear Algebra (CSci 2033)**, University of Minnesota Spring 2017 -Teaching discussion sections, grading assignments and exams.  
**Introduction to Astronomy Labs (AST 1001)**, University of Minnesota Fall 2012, 2014 and Spring 2015 -Teaching six labs, grading student projects, exams and lab reports.

## EDUCATION

**PhD Computer Science** 2015-2021(expected), University of Minnesota, Minneapolis, MN  
**M.Sc. Astrophysics** 2012-2015, University of Minnesota, Minneapolis, MN  
**B.Sc. Physics, Solid State Physics** 2007 - 2010, Yasouj University, Yasouj, Iran

## RELATED COURSES

Advanced Algorithm and Data Structure (CSCI 5421)  
Computation Aspect of Matrix Theory (CSCI 5304)  
Physics Based Animation (CSCI 8980)  
Statistical Analysis (STAT 5021)  
Fundamentals of Computer Graphics I / II (CSCI 5607 / CSCI 5608)  
Computer Vision (CSCI 5561)  
Astrophysical Radiative Processes (AST 8001)  
Astrophysical Fluid Dynamics (AST 8031)

**Class projects:** Smooth Particle Hydrodynamics (SPH) solver, Ray-Tracing Engine, quaternion-based skeletal animation, shape detection .

## AWARDS

**GAANN Fellowship** Graduate Assistance in Areas of National Need. University of Minnesota 2017-2018.