

# Xiaodan Du

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## EDUCATION

### Ph.D. in Computer Science

Toyota Technological Institute at Chicago

Expected: May 2026

GPA: 3.91/4.00

### Master of Science in Computer Science

University of Illinois Urbana-Champaign

May 2020

GPA: 4.00/4.00

### Bachelor of Science in Civil and Environmental Engineering

University of Illinois Urbana-Champaign

May 2018

GPA: 3.96/4.00

Summa Cum Laude

Minor in Computer Science

## PAPERS

### Score Jacobian Chaining: Lifting Pretrained 2D Diffusion Models for 3D Generation

Haochen Wang\*, Xiaodan Du\*, Jiahao Li\*, Raymond A. Yeh, Greg Shakhnarovich

arXiv preprint, 2022

### Text-Free Learning of a Natural Language Interface for Pretrained Face Generators

Xiaodan Du, Raymond A. Yeh, Nicholas Kolkin, Eli Shechtman, Greg Shakhnarovich

arXiv preprint, 2022

## PROJECT HIGHLIGHTS

### Self-Attention Generative Adversarial Networks for Video Generation

Advisor: Professor Svetlana Lazebnik

Urbana-Champaign, IL

Jan. 2019 – Present

- Propose a novel self-attention-driven GANs framework for conditional video generation
- Extend the application of self-attention to video generation and prediction
- Visualize attention maps to prove effectiveness and usefulness of self-attention layers
- Use PyTorch platform to implement the proposed GANs framework

### Caption Aided Image Classifier for Unusual Images

Advisor: Professor Svetlana Lazebnik

Urbana-Champaign, IL

Aug. 2018 – Dec. 2018

- Trained a ResNet50 image classifier on a highly unbalanced “unusual” image dataset
- Created an RNN text classifier based on the image captions
- Integrated the two classifiers to perform combined classification

### Pattern Extraction and Clustering for Events

- Implemented a dependency tree based pattern extraction algorithm to extract meaningful relations and events from the noisy data using syntactic patterns
- Used tree-trie to match any sub-trees of human-written sentences with patterns previously stored

Urbana-Champaign, IL

Aug. 2018 – Dec. 2018

### Computer Vision Based Recognition of Human-Object Interaction

Real-time and Automated Monitoring and Control Lab, Advisor: Professor Mani Golparvar-Fard

Urbana-Champaign, IL

Sep. 2017 – May 2018

- Developed evaluation functions to evaluate trained models based on mean average precision
- Created a Python API that helps in loading and parsing the annotations
- Wrote scripts to transform annotations of HICO-DET dataset into JSON file

### Modeling of Tsunamis and Breaking Waves and their Impact on Built Infrastructure

National Center for Supercomputing Applications (NCSA), Advisor: Arif Masud

Urbana-Champaign, IL

Aug. 2016 – May 2018

- Parallel simulation for CFD (computational fluid dynamics) and FSI (fluid-structure interaction) simulations on Blue Waters supercomputer
  - Parallelized serial code to accommodate to shared- or distributed-memory systems using OpenMP or MPI, respectively
  - Wrote shell script to conduct and manage computation jobs on supercomputers
- Pre-processing for finite element analysis
  - Developed code for fast generation of signed distance field as initial conditions in immersed boundary or free-surface problems
  - Modeled complicated geometries with various commercial meshing tools (e.g., Abaqus)

CAE)

- Post-processing for finite element analysis
  - Reconstructed surfaces of 3D finite element models
  - Presented at Undergraduate Research Symposium on “A Novel Way for Converting 3D images to Finite Element Models”
  - Visualized numerical results from massive simulations by ParaView

### **A System of Recording Temperature and Relative Humidity Inside Mortar Specimens**

*Advisor: Professor David Lange*

*Urbana-Champaign, IL  
Aug. 2015 – May 2016*

- Designed a microcontroller system using Arduino C++ programming environment to transmit data recorded by embedded sensors to SD card

### **Abrasion Rates of Concrete Mixture with Four Different Aggregates**

*Advisor: Professor David Lange*

*Urbana-Champaign, IL  
Jun. 2015 – Aug. 2015*

- Tested and recorded the abrasion rate using Small-Scale Test for Abrasion Resistance (SSTAR)
- Completed a report for U.S. Department of Transportation (DOT) and Federal Railroad Administration (FRA) on abrasion resistance of new materials for highway pavement

## **INTERNSHIPS**

### **Machine Learning and Computer Vision Research Internship**

*Synchrony Financial*

*Urbana-Champaign, IL  
May 2019 – Aug. 2019*

- Developed an online real-time customer tracking system using YOLOv3 deep neural network and Deep SORT algorithm for Synchrony’s cashier-less store
- Proposed a card-less payment solution with real-time facial recognition
- Integrated computer vision and deep learning technologies to perform real-time multi-target multi-camera tracking (demo at <https://youtu.be/TriPz1wGChU>)

### **Architectural Internship**

*von Gerkan, Marg und Partner (gmp) Architekten*

*Beijing, China  
Jun. 2016 – Aug. 2016*

- Created and modified AutoCAD floorplans and SketchUp models for the Asian Infrastructure Investment Bank (AIIB)
- Designed the parking garage of AIIB to accommodate 800+ cars along with all building’s essential MEP equipment

## **TEACHING EXPERIENCE**

### **Teaching Assistant**

*TTIC31020: Introduction to Machine Learning*

*Chicago, IL  
Oct. 2022 – Dec. 2022*

- Wrote assignments
- Held tutorial sessions and office hours every week

### **Teaching Assistant**

*CS101: Introduction to Programming for Engineers and Scientists*

*Urbana-Champaign, IL  
Aug. 2018 – May 2020*

- Hosted and helped improve lab sections throughout the semester
- Composed and reviewed new course materials ahead of time
- Held office hours every week

## **Leadership**

### **Structural Engineers Association - UIUC Chapter**

*President*

*Urbana-Champaign, IL  
Jan. 2015 – May 2018*

- Invited engineers from structural design firms to present their recent projects to students
- Built connections between students and the industry
- Presented civil engineering knowledge to the public at Engineering Open House

### **UIUC Civil China**

*Co-founder and Vice President*

*Urbana-Champaign, IL  
Jan. 2015 – May 2018*

- Created connections between students and alumni to promote their career developments
- Negotiated with the Civil Engineering Department for co-hosting events on traditional Chinese holidays to enhance communication between Chinese and local students
- Lead public communication, planned event logistics, and raised funding

## **SKILLS**

Programming: Python, MATLAB, JAVA, C++, HTML, JavaScript, WebGL, PyTorch, OpenCV  
Computer aided design/engineering: ParaView, SketchUp, Revit, AutoCAD, Abaqus

## **HONORS**

Bronze Tablet – Top 3 percent of the graduating class	<i>May 2018</i>
Ira O. Baker Prize – First Prize (Outstanding Senior)	<i>Feb. 2018</i>
Bowman, Barrett & Associates Outstanding Scholar Award – \$1,000	<i>Feb. 2017</i>
Wayne C. Teng Scholarship – \$2,000	<i>Feb. 2017</i>
Concrete Reinforcing Steel Institute Scholarship – \$3,000	<i>Feb. 2016</i>
Anna Lee and James T.P. Yao Scholarship – \$1,000	<i>Mar. 2015</i>

## **GRE**

Verbal: 162 (91%) Quantitative: 169 (96%) Analytical Writing: 4.0 (60%) Registration #: 1868491	<i>Aug.28th. 2017</i>
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