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EDUCATION

Bachelor of Science in Architecture

University of Virginia

Aug 2019 - May 2023

Master of Architecture

University of Pennsylvania

Aug 2024 - May 2027 (expected)

Master of Science in Design: Robotics and Autonomous Systems (MSD-RAS)

University of Pennsylvania

Aug 2025 - May 2026 (expected)

CURRENT TITLE

Research Assistant at PSL

psl.design.upenn.edu/fang-frank-sun/

FANG SUN

PROFILE

- Fang (Finn) Sun graduated with a Bachelor of Science in Architecture degree from the University of Virginia, distinguished by an insatiable enthusiasm for the intersection of **architecture, artificial intelligence, and digital fabrication**.
- After completing a four-year program and a year of practical experience, he has immersed himself in developing **sustainable and resilient design solutions** through robotics and digital fabrication. With a minor in computer science, he explores AI, computational methodologies, and adaptive modeling.
- His current work focuses on **rapid housing reconstruction** for natural disasters, utilizing 3D printing, robotics, and automation to enhance efficiency, optimize material usage, and improve structural resilience.
- Now pursuing **dual master's degrees** in Architecture and Science in Design: **Robotics and Autonomous Systems** at the University of Pennsylvania, he continues to blend technical expertise, creative vision, and innovation to advance digital fabrication and resilient design.

EXPERIENCE in ARCHITECTURE

Research Assistant | PSL (Polyhedral Structure Lab at UPenn)

Aug 2025 - Now

Philadelphia, PA

- Assisted in module design, assembly, and construction-scale validation of a 3D-printed, post-tensioned concrete floor system, including modular alignment, post-tensioning, and structural strength testing and performance analysis; *co-published research presented at ACM SCF 2025 (Adjunct)* (see *Publications* on page 5).
- Supported project documentation and animations by capturing assembly processes, material application, and structural integration to communicate advanced construction.
- Helped code and maintained the PSL website, ensuring project documentation, research updates, and team activities were accurately reflected and accessible.

Design Intern | Gensler

June 2025 - Aug 2025

San Francisco, CA

- Designed two iterations of the Sky Lobby for CICO project in Hangzhou using Revit; led the design of screens and circulation systems, attended all SD meetings, and presented to clients in China.
- Helped design the ceiling pattern, the overpass connecting two buildings, and the landscape area for NVIDIA Headquarters project; assisted in producing diagrams.
- Supported a pursuit project in Utah through data analysis and circulation design, including calculations for loss factors and solar radiation percentages; assisted in developing diagrammatic visualizations.
- Collaborated with other interns to propose and design a community area in San Francisco aimed at enhancing cultural connections and visitor experience for local residents.

Part-Time Designer | HKS Inc.

Mar 2025 - May 2025

Richmond, VA (remote)

- Helped the Mets Training Building project from SD to DD phases; proposed layout, roof, and entrance design options in Revit, and attended all client meetings.
- Assisted in the design of the Commanders Stadium, developing the bowl form and seating layouts; utilized Grasshopper to visualize and optimize seat arrangements, and designed the video board area.

Teaching Assistant | UPenn (Weitzman School of Design)

Jan 2025 - May 2025

Philadelphia, PA

- Worked as TA for ARCH 2020, Design Fundamental II; helped students in digital and physical fabrication techniques using Rhino and V-Ray.
- Guided students in mapping and analyzing body movement to inform site-specific architectonic designs; provided feedback on translating motion into spatial form.

Project Assistant | Roboticplus.AI (Shanghai) Co., Ltd

May 2024 - Aug 2024

Shanghai, China

- Programmed robotic arm movements for intelligent construction and assisted in developing CNC routers with C++ and Java
- Designed two outdoor installations for the Jindi Office Building project and formulated models for robotic arm 3D printing with Rhinoceros and C++
- Helped Assemble 185 components printed by the robotic arm on site, created progress diagrams, charts and videos for the presentation to clients

Full-time Designer | STUDIOS Architecture

Jul 2023 - Feb 2024

Washington, D.C.

- Modeled the existing 3-story parking garage in D.C. with Revit and designed 6 parametric ceiling and facade options with Dynamo
- Assisted with interior design and rendering for *Institute of International Finance (IIF)* with Enscape; created various furniture layouts and material choices in Revit for 50% Design Development (DD) presentation
- Working on model fixation for *Bond Bread Redevelopment at Howard University* under Design Development (DD) phase, concentrated on remodeling all staircases and podiums, redesigning entries, conducting canopy and roof drain studies

Design Intern | STUDIOS Architecture

Dec 2022 - Jan 2023

Washington, D.C.

- Modeled physical building and site models for 2 ongoing health institution projects with 3D printing and lasering cutting machines
- Created 6 Grasshopper script tests to present the proof of concept of automatic plan generator and parking space formation

Teaching Assistant | UVA (School of Architecture)

Sept 2022 - Dec 2022

Charlottesville, VA

- Worked as TA in ARCH 1010 course, *Lessons of the Lawn*, for 20 undergraduate-level students; provided lectures about Chinese religion and architecture history
- Led discussion sessions; provided feedback and grading on weekly assignments about architectural history and theory

Design Intern | Perkins&Will

May 2022 - Aug 2022

Washington, D.C.

- Benchmarked *UVA Gilmer Hall and Chemistry Building Renovation* projects; purged central and site BIM models and created new Revit templates
- Designed the loading dock and back entrance for *Omega Building & Key West Building in Rockville* and produced rendering images with Photoshop and Enscape
- Proposed 8 logo-inspired iterations of parametric shelf for *Perkins&Will DC office* with Rhino, Grasshopper and Dynamo

Design Intern | HDR Inc.

Dec 2021 - Jan 2022

Arlington, VA

- Drew analysis diagrams and recreated unit models for a children's hospital with AutoCAD, Rhino, Revit and Photoshop
- Designed 10 parametric façade iterations for a project under Schematic Design (SD) with Rhino, Grasshopper, Revit and Dynamo; conducted solar and radiation analysis
- Created 2 Grasshopper plugins (via Python) for HDR employees to conveniently generate solids only using curves in Rhino

DESIGN SKILLS

5+ Years of Experience

Rhinoceros	██████
Grasshopper	███████
Revit	██████
AutoCAD	██████
Adobe Photoshop	███████
Adobe Illustrator	██████
Adobe InDesign	██████
Enscape	██████

3+ Years of Experience

Sketchup	██████
Lumion	███████
Vray	██████
ArcGIS	███████

1+ Years of Experience

Keyshot	███████
ArchiCAD	███████
Dynamo	███████
Maya	███████

LANGUAGES

English | Native
Chinese | Native
Spanish | Intermediate

CERTIFICATE

- National Council of Architectural Registration Boards (NCARB)
- LEED AP Building Design + Construction (LEED AP BD+C)

HOBBIES

Chess | US National Master
Tennis | Chinese L2 Athlete
Biking
Cooking
Photography

Teaching Assistant | UVA (School of Architecture)

Sept 2021 - May 2022

Charlottesville, VA

- Worked as TA in PLAC 4010 and 6010 courses, *Neighborhood Planning Studios*, for 16 graduate-level students; provided feedback and grading for modeling coursework
- Conducted weekly workshops on ArcGIS, Rhino and Illustrator skill development; organized meetings with local architecture firms
- Provided 2 lectures about Chinese Gardens design in related to modern urban studies; assigned written assignments; led discussions and provided feedback

Design Intern | MAD Architects

Jul 2020 - Dec 2020

Beijing, China

- Helped draw the circulation plan and sections; produced rendering images for level 2 exterior space of Jiaxing Civic Center
- Produced rendered drawings for the public courtyard and urban context and proposed 3 gallery iterations for Pingtan Art Museum
- Improved the UI design of firm's website (<http://www.i-mad.com>); utilized the rendering image as the project background and created a sidebar for project listing

Design Intern | Tongji Architectural Design Group

Feb 2020 - May 2020

Shanghai, China

- Helped develop the level 1 gallery space of *Pinghe Secondary School in Suzhou* and drew the plans and perspective sections of the building to present to the clients
- Drew processing diagrams for *Tongji University Creative Research Institute* with AutoCAD and created 3 iterations for its north façade with SketchUp and Illustrator
- Executed aerial documentation through drone photography for the concept design project; acquired up-to-date data for the mapping process; helped concept rendering using Lumion, Enscape and Photoshop

EXPERIENCE in COMPUTER SCIENCE

Java Developer Intern | Alibaba Group Holding Limited

Jun 2021 - Sept 2021

Hangzhou, China

- Co-established the online Internet of Things (IoT) system for Xi'niu's On-demand Production Factory, enhanced efficiency by 21% for the embroidery production line
- Co-developed an automated customer management system for Xi'niu Factory to improve managing efficiency, allowing workers to remotely create printing samples and ship to the factory using Alibaba cloud services
- Reprogrammed label printers and embroidery machines with Java and ZPL to allow remote operations and launched it with new WebUI

Lark Frontend Technical Intern | ByteDance Ltd.

Mar 2021 - Jun 2021

Shanghai, China

- Provided debug and customization services for users of Lark Open Platform (workplace apps developer), led internal monthly SaaS meetings among customers and developers
- Fixed Lark compatibility issues such as plugin conflicts and mobile responsiveness issues, and reviewed a part of Lark 4.0 updates before it was launched.
- Co-initiated Lark Knowledge Base and used Java & Python to encode and categorize previous solutions, provided references for new hired employees

System Test Design Assistant | Apple Inc.

Apr 2017 - Oct 2018

Shanghai, China

- Solved 10 issues in macOS 10.14, including 3 severe security alerts with privacy and message missing; conducted issue reports
- Helped design test cases covering functional and non-functional aspects, including localization and Internationalization, integration and regression (MacOS 10.13.8)
- Collected and provided feedback on the user experience of the iOS 11 Application Program Interface, created comprehensive documentation for internal team reviews

EXPERIENCE in *LEADERSHIP*

CEO & Founder | Hummer Education

Apr 2019 - Now

Shanghai, China (Hybrid)

- Established a 2-person studio and personally instructed high-school students for chess playing every weekend and held regular chess tournaments
- Independently created and published over 400 chess training videos on various media platforms, including Bilibili, TikTok, and YouTube. Spearheaded the online promotion of chess education, garnering a following of over 150,000 enthusiasts
- Established a 12-member company, primarily overseeing various online platforms, including video editing, market operations, and educational services
- Devised chess-playing website and WeChat mini-program with Node.js and React, widely used for online tournaments and training in China since late 2022

Initiator & Leader | Aparkers (Smart Parking Development)

Oct 2016 - Mar 2018

Beijing, China (Hybrid)

- Led a project team of 8 to identify the causes of parking problems in Shanghai
- Designed a parking garage demo to model and devise more efficient parking layouts using Rhinoceros and AutoCAD, employed algorithms using Java and agent-based models to visualize optimized parking routes
- Developed and installed signal detection devices in existing parking lots to assess real-time location for vehicles, aiming to achieve indoor guidance without GPS
- Created a mobile application providing both outdoor and indoor parking guidance and launched it in AppStore and Google Play
- Received the patent (201721325329.0); the project was later acquired by ETCP, a leading company in intelligent parking in China

RESEARCH EXPERIENCE

Independent Researcher | UVA (School of Architecture)

Jan 2023 - June 2023

Charlottesville, VA

- Supervised by Dr. Ehsan Baharlou, developed *Drive Easy*, an innovative solution designed to improve drivers' parking experience
- Identified potential parking constraints and used agent-based modeling to simulate viable parking solutions
- Applied graph theory and generative sorting algorithms to assign the optimal spot for vehicles to reduce time spending
- Integrated AR assistance in a test vehicle and successfully simulated network-independent navigation controlled by IoT devices only in the garage

Research Intern | College of William and Mary (Lens Lab)

Nov 2021 - Jun 2022

Williamsburg, VA (Hybrid)

- Supervised by Dr. Gang Zhou, helped develop a covert channel attack which leaks user data by encoding and transmitting them through smart bulb's infrared emission
- Analyzed power usage pattern of the bulb instead of monitoring the infrared emission
- Helped design a power-auditing system and a CNN model which identifies the smart bulb's leakage of private data

Research Assistant | AZL Architects

Jan 2021 - Mar 2021

Nanjing, China

- Created 7 iterations of entrance design for *Lei House* (a traditional Chinese townhouse) renovation project with Rhino and AutoCAD
- Refined rendered plans and sections for *Ruralation Museum Hotel* (a hot spring resort hotel) for media publication with AutoCAD, Photoshop, and Lumion
- Digitalized and documented the hand drawings of sections and plans for *China International Practical Exhibition of Architecture No.4 House* with AutoCAD and linked with Revit model for detailed model fixation

PROGRAM SKILLS

Program Languages

Java	██████
Python (Django)	███████
C++	███████
JavaScript	███████
HTML/CSS	███████
PHP	███████
Node.js	███████
React	███████
Golang	███████
Ruby	███████

Cloud-Based Technology

Docker	██████
AWS	███████
Apache Spark	███████

RELEVANT COURSES (ARCHITECTURE)

- Architecture History (I & II)
- Foundation Studios (I - VII)
- Modeling Visualization
- Architecture Theory / Tectonics
- Structural Design
- Historical Preservation

RELEVANT COURSES (COMPUTER SCIENCE)

- Software Development Methods
- Discrete Mathematics
- Program and Data Representation
- Cybersecurity
- Machine Learning

PROJECTS in ARCHITECTURE (SELECTED)

Hangzhou CICO Tower - Skylobby

Jun 2025 - Jul 2025

- Interior design, interior rendering, program analysis, facade design (Gensler)

Nvidia Headquarter

Jul 2025 - Aug 2025

- Building design, master planning, interior design, physical model production (Gensler)

Commanders Stadium

Mar 2025 - May 2025

- Stadium (bowl) design, grasshopper scripting (seats), exterior rendering (HKS)

Howard University - Bond Bread Redevelopment

Jan 2024 - Apr 2024

- Building design, master planning, interior design, working drawing production, physical model production (STUDIOS Architecture)

Institute of International Finance (IIF)

Sept 2023 - Dec 2023

- Rhino and Revit file remodel, Interior design, interior rendering, program analysis, material selection (STUDIOS Architecture)

899 North Capitol Street

Jul 2023 - Sept 2023

- Interior design, ceiling and facade redesign, construction drawing production, physical drawing production (STUDIOS Architecture)

Pingtan Art Museum

Jul 2020 - Sept 2020

- Concept design, program analysis, working drawing production (MAD Architects)

PROJECTS in COMPUTER SCIENCE (SELECTED)

Chess Alpha Pro

Apr 2022 - Sept 2022

- A chess reinforcement learning by AlphaGo Zero methods. [Python, Keras, Machine Learning] (Collaboration)

Chess Lc0 Engine (Leela Chess Zero)

Oct 2019 - Feb 2020

- A chess AI following the same type of techniques as AlphaZero using Stockfish's position representation and move generation. [Python, C++] (Collaboration)

FELLOWSHIP & AWARDS

2022 Perkins&Will Summer Internship Design Competition

- Designed an ergonomic chair, finished modeling, drawing, and rendering within a day
- Won the second prize among all participating interns and delivered a presentation

2022 Yongxin Gucheng Bridge Design Competition

- Designed a bridge for both vehicles and pedestrians to ease local traffic pressure, incorporating local climatic and cultural elements
- Received honorable mention from the competition committee

2020 Roboticplus Meng-Xi Innovative Design Fellowship

- Used research funds to design and improve a new 3D printer which is able to print high-strength TPU and nylon, and produced a machine prototype within four weeks
- Integrated the machine into cloud service to address the conflict of control by multiple devices simultaneously; enhanced the printer's capability to print objects with higher slope values by about 18% without support

PUBLICATIONS

- **Toolpath Optimization for a Post-Tensioned Concrete 3D-Printed Floor Structure**
Yefan Zhi, Maximilian E. Orobia, Amir Mostavaselian, Hua Chai, Andrea Machado Romero, Meizhu Xu, Fang Sun, Masoud Akbarzadeh
ACM Symposium on Computational Fabrication (SCF) 2025 (Adjunct) Cambridge, MA, USA

RESEARCH INTEREST

- Human-Centered Architecture Design
- Resilient and Adaptive Architecture
- Generative Space Design with AI
- Advanced Digital Fabrication and Parametric Design
- Smart Cities and IoT in Urban Design and Development
- AI-Driven Tools Development

ONGOING RESEARCH

• Generative Design for Architectural Space Planning

The project aims to generate various plan layouts automatically by outlining a specific area with different functions in the sketching software, allowing designers to explore more possibilities for concepts in early stages.

• Advanced 3D Printing for Rapid Housing Reconstruction

This research explores new technologies and printing methods to accelerate post-disaster housing reconstruction. By integrating robotics, automation, and computational analysis, it aims to enhance construction speed, material efficiency, and structural resilience, enabling scalable and adaptive rebuilding solutions.

SERVICES

Thesis Volunteer | Rice University School of Architecture

Dec 2025 - Jan 2026

Houston, TX

- Helped with detailed physical model fabrication for a thesis project, including the construction of two full-scale (1:1) models to support design testing and presentation
- Supported rendering production and visual analysis, creating image-based renderings that integrated drone photography and on-site imagery to communicate urban context.

Thesis Mentor | Howard University Department of Architecture

Oct 2023 - Apr 2024

Washington D.C.

- Serve as a dedicated professional mentor for a thesis student throughout both Fall and Spring semesters, providing feedback and actively communicate with the student
- Meet with the assigned student twice a week and check the work progress put on Miro; discuss and annotate iterations for further research
- Participate in each formal thesis review, providing insights during each session for all thesis students; collect notes from all reviewers and share with student

Chess Arbiter Volunteer | The 4th Asian Para Games

Oct 2023 - Oct 2023

Hangzhou, China (Hybrid)

- Provided online technical support for game recording and online live broadcasting
- Worked as a B1 category arbiter for fully visually impaired participants, assisted players in moving pieces and ensured fairness and impartiality in each game
- Studied communication languages (Russian, Arabic, Korean, and Malay) from different countries, translated critical tournament information and announcements to facilitate effective communication between players and officials

Career Development Mentor | UVA (School of Architecture)

Jan 2023 - May 2023

Charlottesville, VA

- Offered specific career advice for 5 undergraduate students based on their interests
- Provided resources and guidance for finding job opportunities and helped them prepare for job (internship) interviews and review portfolios individually
- Helped organize career fairs and workshops to foster relationships between students and architecture industry professionals

School Tour Volunteer | UVA (School of Architecture)

Aug 2022 - Sept 2022

Charlottesville, VA

- Conducted regular tours for external visitors showcasing our school building; provided chances to observe ongoing classes and enjoy students' model works in the FabLab
- Introduced the school's history and culture and addressed any questions from visitors

Exhibition Volunteer | Living Garden: The House of the Future

Sept 2018 - Oct 2018

Beijing, China

- Assisted in the coordination of the exhibition by Yansong Ma and MAD Architects
- Collaborated with the event team to design the exhibition layout for four sections, played a key role in the setup to guarantee an engaging experience for attendees
- Led guided tours, offering insights into the design concepts presented by Yansong Ma, enhancing visitors' understanding of the exhibition, and answering inquiries