

HAO "TROY" YU

Address: Rego Park, NY **Personal Website:** trovyu527.github.io/ReactWebsite
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BIM Engineer / Software Developer

AREAS OF EXPERTISE

*Project Planning & Implementation ~ Cloud-Based BIM Solutions ~ BIM APIs Development
Database Management ~ BIM Models Conversion & Integration ~ Web Application Development*

TECHNICAL ACUMEN

AutoCAD | Revit | Navisworks | Civil 3D | ReCap Pro | ACC | C# | Python | HTML/CSS | JavaScript | React |
Node.js | Express.js | D3.js | Three.js | WebGL | Git | Visual Studio | MongoDB | MySQL | Azure | AWS

RELEVANT EXPERIENCE

AECOM • New York, NY, USA

BIM Supervisor – Digital Solutions

01/2024 – Present

- Spearhead the development and implementation of BIM standards, protocols, and workflows, collaborating with project teams and management to define strategies for cloud infrastructure adoption across projects.
- Explore and integrate emerging BIM technologies, tools, and plugins to enhance efficiency and productivity, identifying opportunities to integrate BIM with other organizational software.
- Demonstrate versatility in executing multiple responsibilities:
 - Created C# libraries to retrieve digital data from CAD and Revit via APIs.
 - Deployed Revit models on ACC, streamlining data transfers and exchanges.
 - Applied Dynamo to automate workflows between Revit and CAD, optimizing BIM processes and conducting digital data extraction using SQL and Excel.
 - Conducted Quality Assurance/Control to ensure model accuracy and completeness.

Urbantech Consulting Engineering PC • New York, NY, USA

BIM Engineer / Software Developer

10/2014 – 12/2022

- Developed custom engineering models and software extensions, seamlessly integrating Autodesk Revit to elevate the company's BIM capabilities.
- Created Autodesk Revit plugins, leveraging the Revit API to automate complex workflows and streamline interactions with BIM design objects.
- Designed a desktop application with an interactive UI to automate Bill of Materials (BoM) generation for reinforcing steel designs, improving data extraction from CAD models and reducing manual errors, resulting in a 15% increase in productivity.
- Built a .NET-based software network license management system, improving real-time software usage tracking and optimizing license utilization by 20%.
- Excelled in diverse responsibilities, including:
 - Coordinating and managing BIM workflows and project deliverables, including clash detection, model integration, and database management.
 - Contributing to the development of BIM strategies, exploring innovative BIM solutions, and identifying opportunities to improve efficiency and productivity.
 - Evaluating and selecting appropriate BIM software tools, managing licenses, and contributing to BIM software development.
 - Deploying digital models to database servers and exploring cloud-based sharing solutions for clients.
 - Assisting in building and deploying the company website using a JavaScript framework.
 - Investigating AR/VR capabilities for cloud-based presentations, enabling real-time interaction with digital models.
 - Supporting the integration of LiDAR data into 3D BIM models.

Notable Projects Handled:

Project Name: United Nations Waterfront Esplanade

2024–Present

Location: New York, NY, USA

- Developed and deployed automation pipelines using Dynamo and Python scripts, integrating them into the BIM workflow. Collaborated with stakeholders for seamless digital project delivery.
- Created CAD and Revit plugins using .NET and Revit APIs with C# to facilitate digital data exchange.
- Managed Revit modeling, file handling, and overall BIM lifecycle maintenance.

Project Name: Seaport Coastal Resiliency

2024–Present

Location: New York, NY, USA

- Facilitated BIM data and model exchange between internal teams and external partners. Implemented Revit collaborative systems, overseeing BIM team worksets, and deploying the BIM system on Autodesk Cloud Infrastructure.
- Conducted Revit modeling and collaborated with the structural team to mitigate potential design conflicts, providing guidance on BIM solutions and project direction.

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LiDAR Data/Point Cloud Analysis – Software Development

2018–2021

- Conducted clash detection and deformation analysis by aligning reality capture data with proposed designs. Enhanced precision by reducing noise in point cloud data using Python, optimizing fit for planar regions.
- Refined post-processing techniques to normalize point cloud distributions and generate detailed data reports.

Revit Extensions – Software Development

2016–Present

- Developed custom Autodesk Revit extensions in C#, automating complex workflows and streamlining interactions with BIM design objects through the Revit API.
- Designed and implemented Dynamo scripts and workflows using Python, enabling advanced BIM data manipulation and automation of complex tasks.

RELEVANT PERSONAL PROJECTS

UNO (<http://trovyu527.github.io/uno-web-game>)

Web-based multiplayer implementation of the UNO card game using JavaScript, NodeJS and CSS/HTML

Front-End Development

- Developed a heuristic algorithm for non-human AI players, utilizing a decision-making process based on card weight points within an internal priority queue structure.
- Implemented the web-based front-end using Next.js framework, providing seamless routing among different pages.
- Created a modularized gameplay interface with CSS animations, sound effects, and real-time interactions with players.
- Integrated the "Axios" module for efficient data fetching and communication with the API server.
- Implemented user game account management and security, allowing users to save and load games in real-time.

Back-End Development

- Designed and developed a game backend server to manage game states and enable bi-directional communication.
- Leveraged MongoDB Atlas for secure data storage and Glitch for hosting the backend server.
- Utilized Express.js as the framework for the web-based back-end, exposing RESTful API endpoints.
- Implemented user authentication using the "Bcrypt" module for password hashing and the "Joi" module for verification.
- Integrated "Passport" and "Json WebToken" for simplified authentication processes, ensuring user account security and preventing information leaks.

Visualization of Data Structures & Sorting Algorithms (<http://trovyu527.github.io/visual-algo>)

Interactive web-based visualization of data structures and sorting algorithms leveraging D3.js and jQuery

- Designed and developed interactive visualizations of prominent data structures including trees, heaps, and graphs using the powerful D3.js library.
- Implemented user input handling and asynchronous processing using native JavaScript event listeners and jQuery, enhancing the interactive experience for users.
- Created re-usable modules for SVG manipulation and DOM data binding, resulting in an efficient and maintainable codebase.

Hide & Seek (<http://trovyu527.github.io/hidenseek>)

An Interactive web-based visualization of Dijkstra's algorithm for calculating the shortest path in user-created maze using React

- Designed and developed a robust React component structure and efficient state management system, following best design patterns. This optimized state propagation, simplified debugging, and enhanced state tracking capabilities.
- Implemented a user-friendly graphical web UI that allows users to create and customize mazes for testing purposes. Custom event handlers were utilized to enable intuitive maze design and interaction.
- Integrated the Recursive Backtracking algorithm to generate random maze layouts. This feature provides a variety of maze configurations for route testing and exploration.

OTHER EXPERIENCE

MSV (Mechanic Sound Vibration) Lab, National Taiwan Ocean University • Keelung, Taiwan

Research Assistant – Computational Analysis & Modeling

2009–2010

- Developed engineering models using MATLAB for applied mathematics, with Finite Element Analysis and elements result computation in engineering mechanics problems.
- Worked on practical problems by formulating numerical equations and studying mathematical models.

EDUCATION

Master of Science in Civil Engineering and Engineering Mechanics • 2014
Columbia University • New York, NY USA