

Research Assistant (Frontend Developer) at Carleton Immersive Media Studio

We are currently seeking people to fill positions (part-time or full-time) as developers in the CIMS lab. If you are interested in a position at CIMS, please submit your CV and portfolio/link by email to the following:

To: Professor Stephen Fai, Director, CIMS, sfai@cims.carleton.ca

With CC: Laurie Smith, Research Operations, CIMS, lsmith@cims.carleton.ca,

Lara Chow, Associate Director, CIMS, lchow@cims.carleton.ca,

Nicolas Arellano, Team lead, CIMS, narellano@cims.carleton.ca

Background & Description of Organization:

Carleton Immersive Media Studio (CIMS) is a Carleton University Research Centre (CURC) affiliated with the Azrieli School of Architecture and Urbanism and the Department of Civil and Environmental Engineering. Our research addresses the development of hybrid workflows that both acknowledge the invisible measures of architecture and animate the visible world of construction. Our work uses established and emerging digital technologies to explore and support architectural rehabilitation, heritage conservation and built-asset management. We are advocates for the thoughtful and critical integration of computing and information technologies within existing cultural and disciplinary contexts.

Over the past decade, CIMS has developed an international reputation — working with public, private, and not-for-profit partners — to create a culturally rich and diverse portfolio of projects. We are engaged in five streams of research: Digitization, Modelling, Digitally Assisted Fabrication, Digitally Assisted Storytelling and Digital Twins. Information on past and current CIMS projects is available online at <https://www.cims.carleton.ca>.

Job Description: Research Assistant (Frontend Developer)

We are seeking a skilled Frontend Developer to join our multidisciplinary team working on an innovative open-source Digital Twin platform for deep energy retrofits across Atlantic Canada. The ideal candidate will be responsible for building intuitive, performant, and visually compelling browser-based interfaces that allow non-technical users to explore building stock data, retrofit dashboards, and 3D building visualizations.

Working with a multidisciplinary team in one or more of the five research streams identified above, you will carry out the following responsibilities:

- Design, develop, and maintain robust frontend applications with JavaScript and TypeScript
- Build reusable, accessible UI components using React, Next.js, Tailwind CSS, and shadcn/ui
- Implement frontend visualization components for the panelization feasibility tool, including 3D panel overlay rendering, interactive panel schedule tables, and cost breakdown dashboards
- Integrate frontend components with RESTful APIs to retrieve and display building stock data
- Collaborate with backend developers to define API contracts and data exchange protocols
- Implement responsive, cross-browser-compatible interfaces

- Develop reusable code and component libraries for future use
- Conduct user testing and iterate designs based on feedback from partner stakeholders
- Collaborate with team members to align frontend functionality with backend services and design specifications
- Conduct troubleshooting, debugging, and performance optimization of frontend systems
- Research solutions to technical problems related to interactive visualization and user experience
- Test and improve existing frontend systems
- Maintain thorough documentation of components, design patterns, and architecture decisions

Your core skills must include:

- Proficiency in frontend programming with TypeScript
- Experience with React and Next.js
- Familiarity with component libraries and design systems (shadcn/ui)
- Strong understanding of HTML, CSS, and utility-first styling frameworks (Tailwind CSS, Flexbox CSS, Grid CSS)
- Ability to consume and integrate with RESTful APIs
- Experience collaborating using GitHub for version control and project management
- Understanding of responsive design and accessibility best practices
- Familiarity with open-source libraries and their management

It would be great if you had the following skills:

- Experience with three.js or other WebGL-based 3D rendering libraries
- Familiarity with web mapping libraries (MapLibre GL JS, Leaflet, or Mapbox GL JS)
- Understanding of 3D graphics concepts (meshes, materials, lighting, cameras, scene graphs)
- Mapping or geospatial experience, including familiarity with vector tiles and GeoJSON
- Familiarity with BIM or CAD data formats (IFC, glTF, DXF)
- Familiarity with point cloud data formats (LAS, LAZ, COPC)
- Experience creating wireframes, mockups, and prototypes using Figma or Adobe XD
- Familiarity with authentication workflows (Auth.js, OAuth 2.0, JWT)
- Familiarity with backend technologies (Node.js) for better collaboration
- Familiarity with Linux systems and Docker
- Experience with state management libraries (Redux, Zustand, TanStack Query)

We are looking for a candidate who:

- Is independent and has a willingness to learn new technologies and concepts
- is experienced with AI platforms, able to create strong and reusable prompts, skills, edit suggestions, and automate processes
- Possesses strong problem-solving and analytical skills
- Can communicate complex visualization and design concepts effectively with team members and stakeholders.

- Has a growth mindset and is receptive to changes in the technology landscape
- Demonstrates attention to detail and a commitment to writing clean, scalable code
- Has a strong design sensibility and an eye for clear, intuitive interfaces
- Can work efficiently both independently and as part of a team on visualization-focused projects
- Is eager to learn new skills and technologies in the field of frontend development and 3D visualization
- Has excellent communication skills and is able to explain technical details effectively
- Conduct troubleshooting, debugging, and performance optimization of frontend systems
- Is able to work independently and in a team environment
- Is eligible for federal security clearance in Canada
- Has demonstrated experience working in multi-disciplinary teams
- **Must be an undergraduate or graduate student, or a recent graduate (within 1 year of graduation)**

Please include a link to your GitHub page with your application and links to any deployed projects/websites you have developed/contributed to.

Join our innovative team and contribute to the development of a cutting-edge open-source Digital Twin platform. If you're passionate about frontend development, interactive 3D visualization, and open-source projects, we'd love to hear from you!