Dear Sir or Madam:

I am writing to express my interest in the tenure-track faculty position of Assistant Professor. I am currently a Ph.D. candidate at Purdue University in Construction Management Technology in the Polytechnic Institute. I am now pursuing a Ph.D. with Dr. Jiansong Zhang. My anticipated graduation date is June 2022.

My research interest is focused on increasing the degree of automation in construction activities by developing computational methods and tools. My dissertation research addresses the conversion of natural language building codes from natural language to a computer-processable, formal, and structured format for a BIM-based Automated Code Compliance (ACC) system. To obtain reliable POS tagging results for building codes, I developed error-driven transformational rules and integrated them with deep learning models. Additionally, I proposed a mechanism for automated code compliance checking systems to broaden the range of checkable building code requirements. As part of my Ph.D. research, I designed a system for the extraction and visualization of the hierarchical and cross-reference structure of building codes. Machine learning was heavily applied in my research. However, I am not reluctant to employ a rule-based approach in order to achieve a high level of performance. As a member of the AutoIC lab, I gained exposure to Virtual Reality and robotic construction. Beyond the AutoIC lab, I worked with Professors Pingbo Tang, El-Gohary, and Byung-Cheol Min on the National Science Foundation Partnerships for Innovation (NSF PFI) and the Construction Information System-Open Knowledge Network (CIS-OKN) projects. I also have assisted in the preparation of various proposals, which included conducting a literature review, collecting sample data, generating preliminary results, and preparing proposal documentation.

My prior research experience allows me to direct a research project on Artificial Intelligence (AI) and automated code compliance checking. My research abilities and interests are a perfect match for this position's criteria. For example, in two of my prior journal publications, I used machine learning models such as the Recurrent Neural Network (RNN), the attention mechanism, and the transformer. I oversaw every step of the machine learning model's training and accomplished the majority of work on my own. I completed the data collection, data preparation, model selection, model training, hyper parameter fine tuning, and model evaluation individually. I invited two labmates to collaborate on data labeling in order to generate inter-annotator agreement and confirm the data's quality. The majority of my prior publications dealt with machine learning-based natural language processing. However, I conducted research in the field of computer vision. I used to research the generation of three-dimensional building models from a single two-dimensional image using Concurrent Neural Networks (CNN). To get a greater level of precision, I explored employing a laser scanner rather than a camera-based pure vision solution. I also conducted study on the tracking of on-site employees and equipment. I assessed YOLOv5's performance on this task. Recent advancements in the development of the vision transformer have resulted in new state-of-the-art performance on a variety of tasks. I'm excited to apply it to new types of data, such as satellite sensing data.

Along with my research, I have served on a number of academic committees as a student member, including the American Society of Civil Engineers' Data Sensing and Analysis (DSA) Committee and the American Society of Civil Engineers' Visualization, Information Modeling, and Simulation Committee. Additionally, I have reviewed multiple papers for the journal Advanced Engineering Informatics and the Congress on Construction Research conference.

Teaching is an integral aspect of my academic life. I worked as a teaching assistant for an undergraduate course in construction management. In that role, I created lab question sheets, generated exam questions, supervised and graded examinations, and handled the course's electronic class administration tools (BrightSpace, Blackboard, and Gradescope). My teaching philosophy includes the concepts that: (1) the primary role of instructors should be facilitating an environment where learning can naturally occur, (2) instructors should be frank and open with students, and (3) instructors should work to engage students in the classroom.

I've attached my curriculum vitae, research statement, and three references. I eagerly await your response. I appreciate your time and thoughtfulness in advance.

Best wishes,

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