Xingchen ZOU

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EDUCATION BACK	GROUND
Sep.2023- Present	Hong Kong University of Science and Technology (Guangzhou)
	Master of Philosophy (Supervised by <u>Dr. Yuxuan Liang</u>) Major: Data Science and Analysis
Sep.2022- Aug.2023	The University of Hong Kong
	Master of Science (Supervised by <u>Prof. Francis T.K. Au</u>) Major: Structural Information Engineerin
Sep.2018- Jun.2022	Wuhan University
	Bachelor of Engineering (University Distinction) Major: Civil Engineering
PUBLICATION	
May.2024	Zou, X., Huang, J., Hao, X., Yang, Y., Wen, H., Yan, Y., & Liang, Y. (2024). Learning Geospatial Region Em-
	bedding with Heterogeneous Graph. arXiv preprint arXiv:2405.14135. arXiv
Feb.2024	Zou, X., Yan, Y., Hao, X., Hu, Y., Wen, H., Liu, E., & Liang, Y. (2024). Deep Learning for Cross-Domain
	Data Fusion in Urban Computing: Taxonomy, Advances, and Outlook. arXiv preprint arXiv:2402.19348. arXiv
Sep.2022	Lu, H., Wei, A., & Zou, X. (2022). Experimental Study on Mechanical Properties of Layered Slab-Crack Compo-
-	site Structure Rock Mass. Chinese Journal of Rock Mechanics and Engineering, 2022(S2), 3282-3293.
RESEARCH EXPER	IENCE
May.2022- Present	Intern Researcher, Hong Kong Center for Construction Robotics (HKCRC)
	• Developed the pioneering construction management LLM using knowledge graph enhancement, leverag-
	ing project data to build a dynamic knowledge graph and CoT, reducing AI hallucinations, and enhancing
	real-time project insight for material logistics, management, and decision support.
	• Enhanced Llama2's multimodal perception with real-time imagery and aerial photos, creating visual pro-
	gress descriptions and refining outputs with SAM's segmentation algorithm.
	• Utilized CLIP for modality alignment of aerial and monitoring images with text, boosting predictive per-
	formance for project safety indicators.
Sep.2022- Mar.2023	Research Assistant, Data Acquisition& Analysis Laboratory, The University of Hong Kong
	Collaborated with Hong Kong's Buildings Department to evaluate bridge safety amid global warming, fo-
	cusing on thermal simulation with deep learning based models and made predictions of the thermal state of
	Shenzhen Bay and Tsing Ma bridges using multimodal data and structural designs.
	• Led the prediction of local temperatures series using historical meteorological data from the Hong Kong
	Observatory and precipitation data, experimenting with various algorithms including Linear and TST to
	refine the forecasting model.
	• Responsible for constructing and organizing a comprehensive historical database for multiple bridges, in-
	cluding data assessment and outlier processing.
Sep.2021- May.2022	Research Assistant, Institute of Rock and Soil Mechanics, Chinese Academy of Sciences
	• Carried out extensive triaxial shear and tensile tests on rock species about Sichuan-Tibet Railway Construc-
	Used high speed compare to continue the deformation process of nodes and modeling the deformation pro-
	• Used high-speed camera to capture the deformation process of rocks and modeling the deformation pro-
	 Classified the deformation characteristics of rocks under different external conditions with deep learning
	methods and studied the influence of internal creaks in rocks on deformation under specific conditions
May 2021 San 2021	Intern Data Analysts Smart Building Engineering Lab. Fosun International Limited
Wiay.2021-Sep.2021	 Involved in developing the group's operational risk control information system integrating project data
	and utilizing XGBoost for risk assessment, with visualization of high-risk insights
	 Responsible for the maintenance of the group's project operation database. docking with project teams and
	conducting field inspections, optimizing code and system rule design based on users' feedback.
ACADEMIC PROJE	CTS
Sep. 2023-Jan.2024	Spatiotemporal Sequence Prediction Based on Large Language Models
·····	• Developed a Spatiotemporal LLM based on Time-LLM, incorporating spatial correlations between different
	time series in addition to temporal dynamics. Constructed a lightweight decoder using convolutional neural
	networks to convert the spatial structure of data into embedding vectors and input into the LLMs.
	• Utilized a large language model with parameter freezing to generate predictive structural tokens, and de-
	signed a symmetrical decoder to decode them, resulting in future predictive numerical outcomes.
Apr.2023- Aug.2023	Classifier for Worker's Working Posture Based on Smartphone Sensors for Health Monitoring
5	• Developed an innovative REBA model for construction scenarios, utilizing smartphone sensors (accelerom-
	eters, gyroscopes, etc.) to infer workers' body postures. Accounted for various scenarios such as phones in
	pockets, on belts, and in bags to enhance the model's generalization capabilities.
	• Implemented body posture classification based on multi-sensor time series using deep learning algorithms.
	Utilized the PatchTST model and multivariable factor collaboration to predict current body postures.

Oct.2022- Mar.2023	 An Initial Model for Prediction of Rock Joint Roughness and Based Convolutional Neural Network Fine-tuned the YOLO vision recognition model for industrial scenarios to automatically extract rock surface texture features and distribution based on image scanning results. 	
	• Utilizing generative models (Diffusion) and empirical mechanical formulas to create a large dataset for pre-	
	training, followed by fine-tuning the model with real images and manually calibrated datase	ts.
OTHER EXPERIENC	CE	
Jun. 2023-Present	JBot (Hong Kong) Technology Co., Ltd. (CR NO. 3223788 HK), Founder	
	• As the sole student founder, I led technology and product strategy of the team. Our tech star	up, backed by
	HKUST and HKSTP with over 1.5 million HKD in venture funding, focuses on intelligent c	onstruction and
	was co-founded by a team of six from HKUST and HKU.	
	• Led the development and launch of an innovative waterproof construction robot in collaboration with DJI.	
	Managed the motor drive and four-wheel embedded system, utilizing Abaqus for dynamic simulations and model calibration. Optimized the drive design for all-terrain mobility under heavy loads.	
	reinforcement learning algorithms. Handled industrial design and promotional activities for	the product.
AWARDS AND HONO	DURS	-
	Thesis Writing Competition of HKUST (1 nd Prize)	Jan.2024
	Outstanding Graduate (top 10%); Wuhan University	May. 2022
	Chinese Structural Design and Information Technology Competition (National 2 nd Prize)	Apri.2022
	Excellent Student Scholarship (top 10%); Wuhan University	Sep. 2021
	Outstanding Student (top 30%); Wuhan University	May. 2021
	Excellent Student Scholarship; Wuhan University	Sep. 2020
	Excellent Student Cadre (top 1%); Wuhan University	May. 2020
PROFESSIONAL SKI	LLS	
Languages	English (medium, IELTS 6.5), Mandarin (native)	
Computer Skills	Pytorch, MySOL, Linux, LATEX, Abagus, Revit, MATLAB, Photoshop	