PhD scholarship on green technologies for soil reinforcement: Application to buildings and structures underpinning

Shandong University, China

About the position

School of Civil Engineering of Shandong University invites applications for a PhD Scholarship at Shandong University, China. The research project will focus on green technologies for soil improvement such soil bio-cementation. In Fact, the global climate changes have led to an increase in the frequency of flooding in various regions across the world. As a result of these shifts, water levels have risen in different areas, leading to challenges for building foundations, particularly older structures. These challenges stem from a reduction in the bearing capacity of the soil and increased instances of excessive settlements. Various technologies are employed for underpinning buildings and structures which have these problems, including micro-piles, jet grouting, and cement injection, among others. However, it's worth noting that these techniques often have adverse environmental effects, primarily due to their significant CO2 emissions and the potential to introduce various chemical components into the groundwater. Additionally, some of these methods can be challenging to apply in certain scenarios. For instance, micro-piles may require large machinery that isn't suitable for smaller buildings, huge number of injection holes, and high-pressure injections can be detrimental to older structures and the surrounding soil. In light of these concerns, MICP emerges as a promising alternative, particularly in the critical situations mentioned earlier. Unlike other methods, MICP doesn't necessitate extensive machinery or high-pressure injections or a huge number of injection points. As such, we are actively pursuing the development and utilization of this technology for foundation underpinning, with a special focus on historic and aging structures, as well as heritage buildings. This approach aims to address the environmental and logistical challenges associated with traditional underpinning techniques while ensuring the preservation of valuable architectural and historical landmarks.

About the university

Shandong University, under the direct jurisdiction of the Ministry of Education, is a leading university in China with a membership of Project 985. It ranks 201-250 in the world according to ARWU world university ranking 2023. The university is based in Jinan, the capital city of a coastal province Shandong Province.

Qualifications

Applicants must have a Master degree in Engineering, Science or other relevant disciplines. Good abilities or experiences in computer programming, image processing and experimental soil mechanics are highly valued. Foreign applicants are also welcomed and we will help the successful candidate to obtain a Chinese visa.

Salary and contract

The students will benifis of CSC scholarship 36 000 - 42 000 CNY / year, depending on the performance and contribution to the institute. On-campus accommodation will also be

provided for free for. In addition, the living standard in Jinan is rather low. Transportation, food, and goods are half the prices compared to the cheapest European countries. The services and accommodation are much better with low prices.

The position is expected to get started as early as possible. Contract duration: 3~4 years (extensions are possible if additional funding will be acquired).

Closing date for applications

The team will recruit one student every year until 2025, so this advertisement will be long-term effective. But early applications are more welcomed.

Contacts

Please submit a C.V. including two academic reference letters to the PhD supervisors Prof. Ji-Peng Wang: ji-peng.wang@sdu.edu.cn and Dr. Abdelali Dadda : abdelali.dadda@ sdu.edu.cn. After a review of the background of the candidates by the team, formal applications to the university will be invited.