Dear professor,

I am Xi Peng, a lecturer from NingBo University of Technology, which is an undergraduate institution of higher education, located in Zhejiang province, China. As the representative of the bridge engineering team of our university, I would like to contact you to carry out cooperative research on related scientific research projects.

Recently, the department of international cooperation of the ministry of science and technology of China issued a notice on the exchange program for the staff of the 5th regular meeting of the China-Slovenia science and technology cooperation committee. The fifth regular meeting of the China-Slovenia intergovernmental committee for scientific and technological cooperation is scheduled to be held in 2020. The government is now soliciting exchanges and cooperation on basic research, applied research and technology research and development.

Currently, the bridge health monitoring system is developing rapidly in China. The system can monitor the structural characteristics and health status of Bridges in service during their daily operation. Our university has a certain scientific research foundation in the health monitoring of Bridges, and we sincerely hope to have the opportunity to cooperate with you in the scientific research. We hope to cooperate to develop the platform of intelligent health monitoring and operation management for bridge groups, and realize the promotion and application. The following is the topic and content of our cooperation, we sincerely hope to get your guidance and support.

The deadline for project application is April 30, 2020. It is a very limited time. Thanks again for taking the time to read this project book. The term of the project is two years, which needs to get phased results, and the focus is on the exchanges between China and Slovenia. For the personnel exchange projects included in the protocol of this regular meeting, the competent departments of science and technology of the two countries will jointly finance an exchange of visits between the two sides during the project implementation period.

If you are interested in participating in this project, both of us must submit application materials to our respective science and technology authorities. Materials include "application form for China-Slovenia science and technology regular meeting exchange program" and "project basic information form". I only have the template in Chinese, I think you can download it from the government website of Slovenia. Items declared by one party are invalid. The English name of the project, the China-Slovenia cooperative entity and the project applicant must be consistent.

Looking forward to your reply.

Best Wishes.

Xi Peng

My email: snpengxi@163.com

**Attachment:**

**Title：The Platform Development of Intelligent Health Monitoring and Operation Management for Bridge Groups**

**1 Contents of cooperation**

In recent years, expressways, high-speed railways and public transport systems have developed rapidly all over the world. As the hub of transportation, bridge is the lifeblood of economic development and plays an important role in the transportation system. The Zemun-Borca Bridge built by the cooperation of China and Slovenia in 2014, has brought the great influence of transportation and economic development in Belgrade, which is called Chinese bridge or friendship bridge by the local government and people. However, the bridges under the influence of external environment and vehicle loads will inevitably come into being some local or overall damages which may be cause the degradation of bridge performance, or even lead to collapse accidents. Under the huge needs of bridge maintenance and safety assurance, if the health condition of the bridge is obtained in real time, and the damage or disease of the structure could be identified as early as possible, the maintenance measures will be taken in time to ensure the safe operation of the bridge, which has important practical significance. To meet the needs of intelligent safe operation and management of Bridges, the following cooperation is planned with the aim of remote, automatic, rapid and sharing.

(1) In the world, the structural health monitoring system with lots of sensors has been installed on many bridges, especially in the long-span bridges. Based on the existing technical conditions, the new intelligent system for data acquisition will be built to monitor the structural responses and the mechanical parameters of the bridges during operation. Through the finite element model and monitoring data, the technology of real-time data processing and analysis based on cloud computing will be studied in order to have the functions of collection, real-time display, storage and data export, and to realize the real-time monitoring of bridge safety condition.

(2) Image processing, pattern recognition and computer vision have developed rapidly recently. Especially visual equipments for non-contact measurement and detection, such as high-speed cameras and unmanned aerial vehicles, have a special advantage in information collection. It is proposed to study the detection and recognition technology based on digital image recognition for the bridge deformations, cracks and other defect features. It is hoped that the automatic identification of feature parameters can be realized through non-contact acquisition such as taking photos and photographing, so as to provide basic data for bridge operation and management.

(3) On the basis of research contents (1) and (2), the collaborative integration of the bridge health monitoring system and the multidimensional operation management system is planned to be studied to overcome the "information isolated island" phenomenon of most bridge monitoring systems. A platform development of intelligent health monitoring and operation management for bridge group with disease identification, patrol inspection and maintenance, safety monitoring and early warning technologies is planned to be developed by combining technologies of all parties.

**2 Cooperation Objectives and Key Indicators**

(1) According to the conditions in China and Slovenia, the intelligent collection equipments will be integrated and optimized, and the intelligent health monitoring platform for bridges considering the Chinese and European standards will be built, which is expected to realize the international exchange of technology.

(2) The platform of intelligent health monitoring and operation management for bridge group for urban traffic will be developed, which is expected to realize the resource integration and overall planning of regional bridge information. It can be used to improve the efficiency of bridge management and maintenance and provide necessary conditions for the internationalization of technology.

**3 Expected Economic and Social Benefits**

The research results of this subject can effectively promote the development of intelligent use and longer service life of bridge structures. In terms of intelligent management and maintenance of bridges, the concepts of "intelligent monitoring" and "cluster management" are put forward to enhance connectivity, improve the management efficiency and ensure the safe operation of bridges. Through the strategy of timely inspection and maintenance, the costs of serious reinforcement during the bridge service will be saved, the life-cycle costs will be reduced, and the sustainable development of the construction industry will be promoted. Through the basic research of transportation construction project, it can actively promote the strategic process of "one belt one road", and promote the cooperation and development between China and Slovenia, which is conducive to the promotion and application of bridge management technology in the world.