UNNC – Zhejiang University, Ningbo Doctoral Training Partnership

Available PhD topics

PhD topic 1	Crowd intelligence computing for innovation design
ZJU, Ningbo Supervisor	Prof. Shijian Luo
UNNC Supervisor(s)	Dr. Gavin Lai
Short introduction & description of PhD	With the rapid development of Internet and Artificial Intelligence technology, traditional individual designer-oriented product design has shifted into crowd intelligence collaborative innovation mode. This topic will efficiently generate user satisfied product shape design with crowd intelligence computing method to improve the ability of design innovation, in which the multi-knowledge is integrated. Establishing multiple-role product design evaluation criteria system, employing crowd intelligence computing method to launch multi-level interactive optimization and computation, adopting natural computing method to set up bi-directional reasoning between evaluation mechanism and generated product shape design, and leading shape design to meet desired direction.
Contact points	Informal inquiries may be addressed to Prof Shijian LUO (sjluo@zju.edu.cn) and Dr Gavin Lai (gavin.lai@nottingham.edu.cn), but formal applications should follow the instructions in 'How to apply' section.
PhD topic 2	Developing vacuum-based wall-climbing robot in legged type for maintaining the façade of high-rise buildings
ZJU, Ningbo Supervisor	Assoc. Prof. Cheng YAO
UNNC Supervisor(s)	Dr. Jiang WU (http://www.jwwwwu.com)
Short introduction & description of PhD	Nowadays, glass giants are rising rapidly in modern cities. They are not just a grand view of the skyline but changing our urban lives with expanding vertical space. Unlike the manual operations on the ground, direct access by laborers is costly and hazardous on the glass slabs of high-rise buildings. Therefore, the need for wall-climbing robots and related systems has grown steadily in the last two decades. Depending on locomotion, the robots can be differentiated into three types: crawler, wheeled, and legged. Considering the Parametricism style is getting popular in architectural design, future façade of high-rise buildings will adopt large numbers

	of unified and curved forms. That provides excellent opportunities to develop legged-type wall-climbing robots, which can cope with flat and complex glass slabs. This project aims to innovate the technologies of legged type wall-climbing robots. To increase the operational efficiency of the robots, we will focus on the vacuum-based adhesion method and develop more lightweight and easier-to-control robotic systems for maintaining the complex façades of high-rise buildings.
Contact points	Informal inquiries may be addressed to Dr Jiang WU (jiang.wu@nottingham.edu.cn) and Assoc. Prof. Cheng YAO (yaoch@zju.edu.cn), but formal applications should follow the instructions in 'How to apply' section.
PhD topic 3	**Human Factors Research in Automated Vehicle**
ZJU, Ningbo Supervisor	Prof. Shijian Luo
UNNC Supervisor(s)	Prof. Xu Sun
Short introduction & description of PhD	The topic will to generate the scientific knowledge necessary to facilitate intelligent data-driven design for future vehicles, specifically through new data-driven models that can predict/explain the relationships between different user, task and environment variables as they relate to automated vehicle design characteristics. There has been an emphasis on how from a technological perspective the status of the driver (e.g. emotions, fatigue, motionsickness system use) can be monitored and predicted– especially in real-time. A new data-driven vehicle concept will be developed that demonstrates the ultimate user experience by showcasing the novel adaptive Human Machine Interfaces (HMIs) developed within the research theme. There is a focus is to explore how a driver profile, specifically within an automated driving context and generated based upon driver status, can be used to inform intelligent adaptations of the HMIs.
Contact points	Informal inquiries may be addressed to Prof Shijian LUO (sjluo@zju.edu.cn) and Prof Xu SUN (Xu.Sun@nottingham.edu.cn), but formal applications should follow the instructions in 'How to apply' section.
PhD topic 4	**Human-Centered Approach to the Design of Flight Training Simulators**
ZJU, Ningbo Supervisor	Assoc. Prof. Cheng YAO
UNNC Supervisor(s)	Prof. Xu Sun
Short introduction & description of PhD	The project will review the key component technologies of flight simulators and how they support the pilot's experience of flight trainning. It will also examine the effectiveness of different types of technology enhanced (e.g. Augumented Reality, Virtual Reality) simulations in pilot training and evaluation. Based on a systematic review, the project will propose an innovative approach with a simplified but effective training method to improve pilot's learning efficiency and user experience within the virtual environment.
Contact points	Informal inquiries may be addressed to Assoc. Prof. Cheng YAO (yaoch@zju.edu.cn) and Prof Xu SUN (Xu.Sun@nottingham.edu.cn), but formal applications should follow the instructions in 'How to apply' section.

PhD topic 5	Smart Healthcare for the Elderly, Information Cognition, Interactive Behavior
ZJU, Ningbo Supervisor	Prof. Shijian Luo
UNNC Supervisor(s)	Dr Yanhui Zhang
Short introduction & description of PhD	With the rise of IoT, wearable devices and smart home products for the elderly have already emerged. There are health and medical product designs such as walking aid, sleeping aid, hearing aid, vision aid, memory aid and fitness aid. The popularity of digital technology and intelligent mobile terminals has deepened the research on human-computer interaction, cognitive and behavioral characteristics of the elderly, not only in the level of physical products, but also in the visual, auditory and other aspects of perception. The research focus on the information cognition and interaction behavior of the elderly will support for home-based and community-based healthcare services.
Contact points	Informal inquiries may be addressed to Dr Yanhui Zhang (Yanhui.Zhang@nottingham.edu.cn), but formal applications should follow the instructions in 'How to apply' section.
PhD topic 6	Smart Object & Ambient Environment for Daily Life
ZJU, Ningbo Supervisor	Assoc. Prof. Cheng YAO
UNNC Supervisor(s)	Dr Tengwen Long
Short introduction & description of PhD	After many years' research of ubiquitous computing and computer human interaction, computing technology was embedded into our lives. Television, phone, car, even our house are becoming more responsive and interactive. The procedure is progressing. During it, how daily life objects will evolve, behave and function? What rules are going to be defined? What is the next stage that we are heading to? There are many potential topics will rise from the unknown. Research in this direction will bring possible solutions to certain problems by designing and prototyping objects containing hardware and software with human-like emotions. Topics of current stage will cover widely from embedded intelligent things, learning tools, human assistants to smart office, adaptive home, active aging, etc.
Contact points	Informal inquiries may be addressed to Assoc. Prof. Cheng YAO (yaoch@zju.edu.cn) and Dr. Tengwen Long (tengwen.long@nottingham.edu.cn), but formal applications should follow the instructions in 'How to apply' section.