

## FREIE UNIVERSITÄT BERLIN Fachbereich Mathematik und Informatik

Promotionsbüro, Arnimallee 14, 14195 Berlin

# DISPUTATION

**Mittwoch, 25. Mai 2016, 15.00 Uhr**

**Ort: Seminarraum 2006, Zuse-Institut Berlin (ZIB),  
Takustraße 7, 14195 Berlin**

**Disputation über die Doktorarbeit von**

**Herrn Yi Sun**

**Thema der Dissertation:**

**An Indoor Positioning Strategy based on Inertial Sensors**

**Thema der Disputation:**

**An Autonomic Indoor Positioning Application based on Smartphone**

Die Arbeit wurde unter der Betreuung von **Prof. Dr.-Ing. J. Schiller** durchgeführt.

Abstract: The indoor scenario is also called the GPS-challenged environment due to the obstruction and accuracy reasons of the satellite based positioning methods. The current solutions to this problem are primarily resorting to the local communication networks, e.g. WLAN or Bluetooth. In this presentation an autonomic positioning strategy is proposed, which relies solely on inertial sensors. Because of the interference immunity and unobtrusiveness of the Inertial Measurement Units (IMUs) the reliability and invulnerability of the system deserves to be enhanced substantially.

In reality certain body impulses are prompted when a pedestrian is walking. This sort of impulses would be recorded by the accelerometer in user's smartphone. Associated with the extra data sampled by other built-in inertial sensors, the motion patterns of the pedestrian are recognized, in which the length and azimuth of each step are reckoned. Accordingly the current position is supposed to be updated in real-time. Eventually Particle Filter is employed for map matching and digital barometer is utilized for altitude estimation. As a result, the full function of an indoor positioning system is implemented and the serviceability is expected to be improved fundamentally.

Die Disputation besteht aus dem o. g. Vortrag, danach der Vorstellung der Dissertation einschließlich jeweils anschließenden Aussprachen.

**Interessierte werden hiermit herzlich eingeladen**

Der Vorsitzende der Promotionskommission

Prof. Dr.-Ing. J. Schiller