Building Information Modelling and Management Teaching in Geospatial Engineering, Civil Engineering and Architecture

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### Introduction



Some Background on BIM Teaching
BIM Modules at Nottingham
BIM Teaching Facilities
Masters Courses
Conclusions

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### University of Nottingham Knowledge Without Borders 诺丁汉大学 知识无边界





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### **BIM Education Background**

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China accounts for 47.9% of the Asia-Pacific construction industry value. (MarketLine, [1])

There were insufficient qualified BIM staff in China's AEC project management. (SCTA & LC [2] and SZEDA) [3])

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### **BIM Education Background cont**

 Lack of BIM personnel or BIM expertise was perceived as one major obstacle in BIM usage in the industry in both UK and China. (SCTA & LC [2]., and Eadie et al. [4])

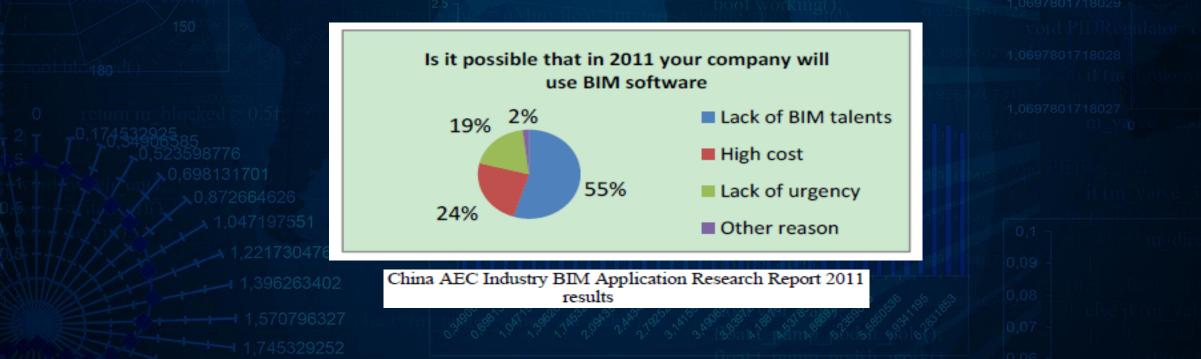
 The diversified BIM areas and new BIM movements have created a greater demand on competent BIM professionals and college graduates with relevant BIM knowledge. (Jäväjä, S.S.P. & Salin, J. [5])

 Insufficient resources and university conservations are key barriers to promoting engineering education to meet the demands. (Trine, [6])

## **BIM** in China



The 2011-2015 National Program of AEC Informatisation Development was published in May 2011 by China Ministry of Housing and Urban-Rural Development, and set out its intention to decide BIM as one of the core technologies in survey, design and building industry in the 12th five-year national plan in China.



# **BIM Teaching at Nottingham**

- H21EC1 Engineering Communication
  - Compulsory 1<sup>st</sup> Year Module (BEng Civil Engineering)
- EE3BIM Engineering Communication
  - Optional Final Year Module (BEng Civil Engineering, BArch Architecture), Compulsory for MSc

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 H23TMB – 3D Modelling for BIM
 Optional Final Year Module (BEng Civil Engineering, BArch Architecture ), Compulsory for MSc

## H21EC1 – BIM Content

 H21EC1 – Engineering Communication is designed to teach students effective communication through IT and personal abilities

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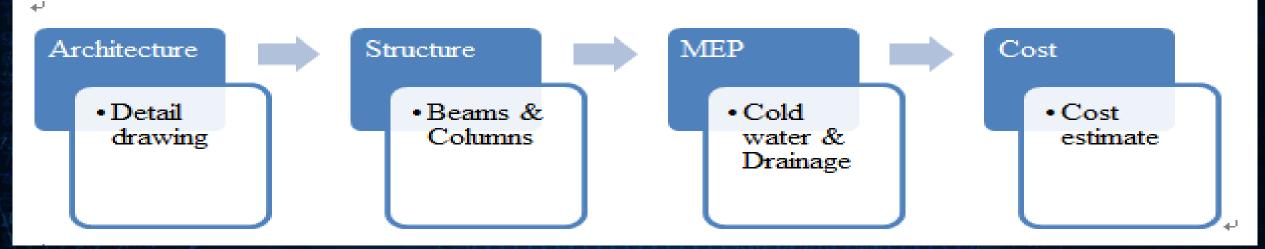
- BIM was introduced into the module 3 years ago to complement the large CAD element of the module
- BIM Content
  - 2 Hours of lectures
  - 2 Workshops (Using REVIT)
  - 1 Coursework hand in (Essay)

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### EE3BIM – BIM Teaching



- Each student group consisted of members from different subjects;
- Teams use REVIT to produce BIM models in a collaborative process



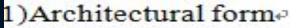
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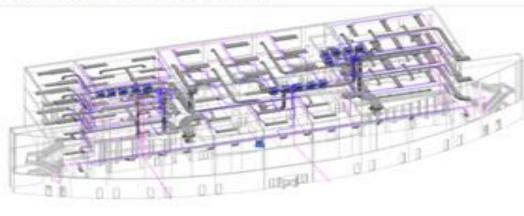
### Group Project Process



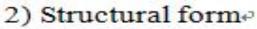
### EE3BIM – BIM Teaching An example of group project







### 3) MEP system



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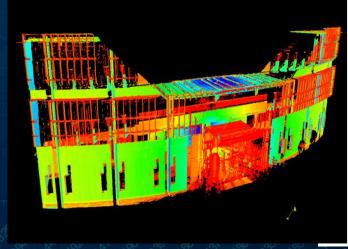
## H23TMB – BIM Teaching

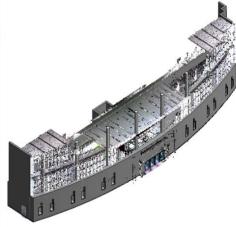
Data Capture Techniques

### Registration of Point Cloud Data

Cleaning of Point Cloud Data

Creation of Building Elements in REVIT to Create BIM The module describes data collection techniques and is focused on group project work.









# **Teaching Facilities**

- D-CiTi BIM Lab
  - Opened December 2015
  - Funded by Ningbo Government
  - Multidisciplinary
  - Photogrammetry and Remote Sensing Lab
    Civil Engineering Department
  - Extensive Software
  - BIM equipped Computer Labs

## D-Citi Lab





#### 156 m<sup>2</sup>

18 3D Workstations

**6** Ultra High Performance Workstations

**2** Mobile Graphics Workstation

**1** Meeting Room

**1** Virtual Reality, Augmented Reality Demonstration





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## Photogrammetry and Remote Sensing Lab

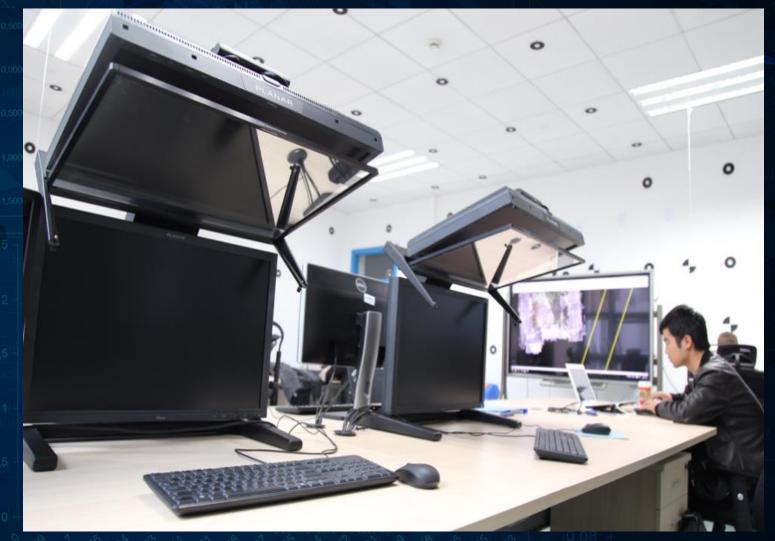




### BIM Computer Room BIM 机房 (130+)



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UNITED KINGDOM · CHINA · MALAYSIA

### Software





### MSc in Engineering Surveying and Geodesy Core modules: 10/credits each

Autumn semester。。。。。。。。。。。。。。。。。 Fundamentals of Satellite Positioning Analytical Methods **Geodetic Reference Systems** Photogrammetry and Remote Measurement Techniques **Research Project Literature Review** Advanced Satellite Positioning **Engineering Surveying Physical Geodesy** Survey Field Course **Research Project Organisation and Planning** Summer semester 60 credits **Research Project – MSc dissertation** 



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### MSc in Geospatial Engineering with BIM



Core modules: 10/credits each

Fundamentals of Satellite Positioning **Analytical Methods** Introduction to BIM Photogrammetry and Remote Measurement Techniques **Research Project Literature Review** BIM Knowledge and Management **Engineering Surveying** Global Smart City with Integrated BIM **BIM+ and Its Future Research Project Organisation and Planning** <u>Summer semester</u> 60 credits **Research Project – MSc dissertation** 

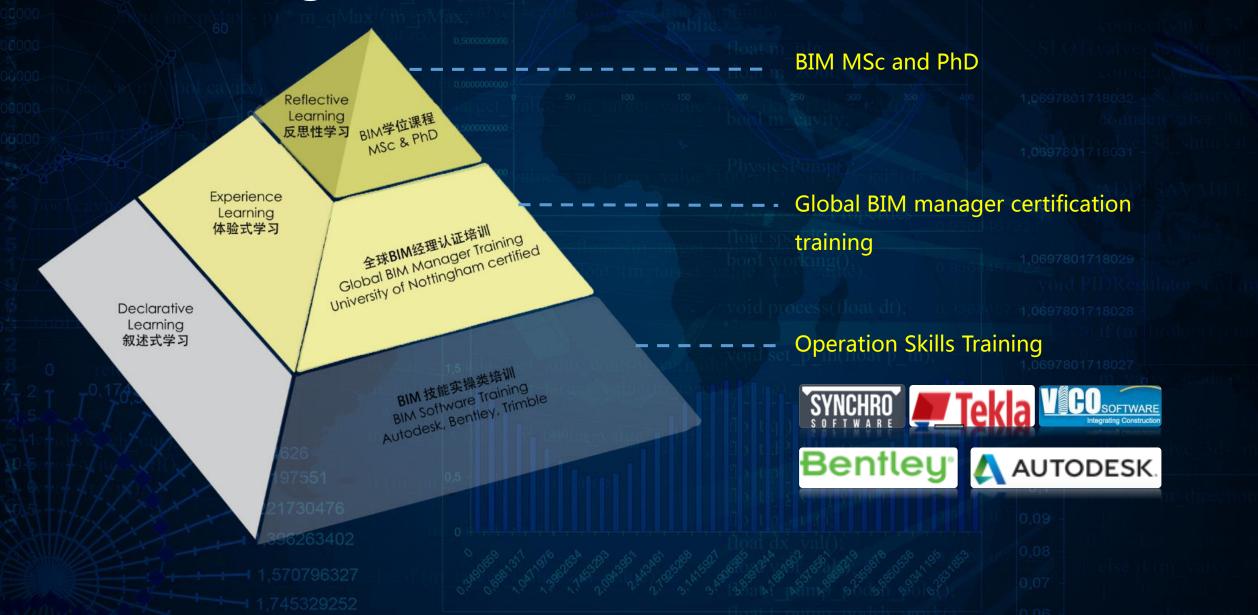
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# **BIM Training**





# Summer School

- In July at Nottingham China
  Places still
  - available

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## The Future

 To continue development of BIM content on the UG and PG courses at Nottingham

- To continue to develop CPD courses to train industry
- To Launch a full BIM MSc in the near future

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### References



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[3] Shenzhen Exploration & Design Association (SZEDA), Guide for BIM application and development in the engineering & design industry of Shenzhen, Tianjin Science & Technology Press, Tianjin, pp. 20-22, 2013.

[4] Eadie, R., Browne, M., Odeyinka, H., McKeown, C. & McNiff, S., BIM implementation throughout the UK construction project lifecycle: an analysis. Automation in Construction, 36(2013), pp.145-151, 2013.

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[6] Trine, R. Engineering education: quality and competitiveness from the European perspective, TREE-disclosing conference – a report, TREE –teaching and research in engineering in Europe, 2008.

# THANK YOU



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