FIG Working Week 2016

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Recovery from disaster

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Teaching BIM to Geomatics Students

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Why BIM?

- BIM is cool
- Government and construction industry have high demands on BIM professionals

Why BIM for geomatics?

- Measured surveys are a big part of BIM
- Reliable as-built surveys and monitoring
- Managing TLS and Photoscanning
- Geodata-Management, Coordinates
- Legal Boundaries, Utilities and Infrastructure
How did we prepare as teachers?

- Textbooks and software Manuals are **NOT** enough, there is no traditional BIM curriculum yet.
- Realising BIM projects with **industry** partners
- Liaisons with other **faculties** (e.g. civil engineering faculty)
- Visiting other **universities** (e.g. DIT)
- Attending and helping standard organisations (DIN, DVW, FIG)
- Offering “off the job training”
What did we learn in Dublin?

- importance of **interdisciplinary** work
- **pointcloud** management with BIM software
- BIM **software tools** for engineering surveyors

**BIM at Dublin Institute of Technology**

- development of a suite of cross-disciplinary, collaborative, **postgraduate programmes in BIM** from 2014
- **Geomatics for BIM** module for MSc Geospatial Engineering

Practice #1 BIM basics

- BIM as **database** – not drawing
- precise modelling with building objects
- From floorplans, and sections to semantic 3D model with given drawing and workflows
Practice #2: Creating Types for Object Libraries

- Creating and managing **building elements** (objects) with Autodesk Revit Family Editor
- **Parameterisation** of dimensions and materials
- Showing the importance of **object libraries** also for measuring existing buildings
- Reference-plane and topology of building elements
Practice #3: Pointclouds – native support

- **preparation** of the point cloud for Autodesk Revit
- pointcloud as *reference for the digitalization* of building elements
- as-build comparison between an existing model of the building and the point cloud
Practice #4: Pointclouds – professional tools

- PointSense for Revit, Faro 3D Software GmbH (Dresden)
- Point cloud in family editor
- Semiautomatic detection and placing of building elements
- BIM-Beautification (89,9° vs. 90°)
Practice #5: Coordinate Systems

- **Concepts and limitations** of internal, project, shared coordinate system
- Working with **georeferenced** CAD-files
- **Adjusting** a planned building to a parcel boundary
- **Digital Terrain Models** (DTM)
Practice #6: Setting out

- managing **surveying points** with Autodesk PointLayout
- comparing points as-planned vs. as-built
- slap analysis
- setting out **reports**
- best-practice **workflows**
Practice #7: BIM to GIS

- **GIS**: Set up a coordination model with building, DTM, tunnel, railway, vegetation, lake, … (example taken from CityGML Homepage)
- **Management**: Importing and managing diverse models with Autodesk Navisworks
- **Analysis**: Clash detection
- **Visualisation**: Export to Google Earth Viewer (kml)
Open questions

• Is Autodesk Revit the right choice?
• How to find the balance between practical knowledge (“buttons”) and theoretical concepts?
• Should Software development for BIM (e.g. DYNAMO, C# API) be part of the education?
• What to leave out in traditional curriculum due to limited time?
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