



26-09-2019 – 12H – 18H30 – VUB BRUSSELS

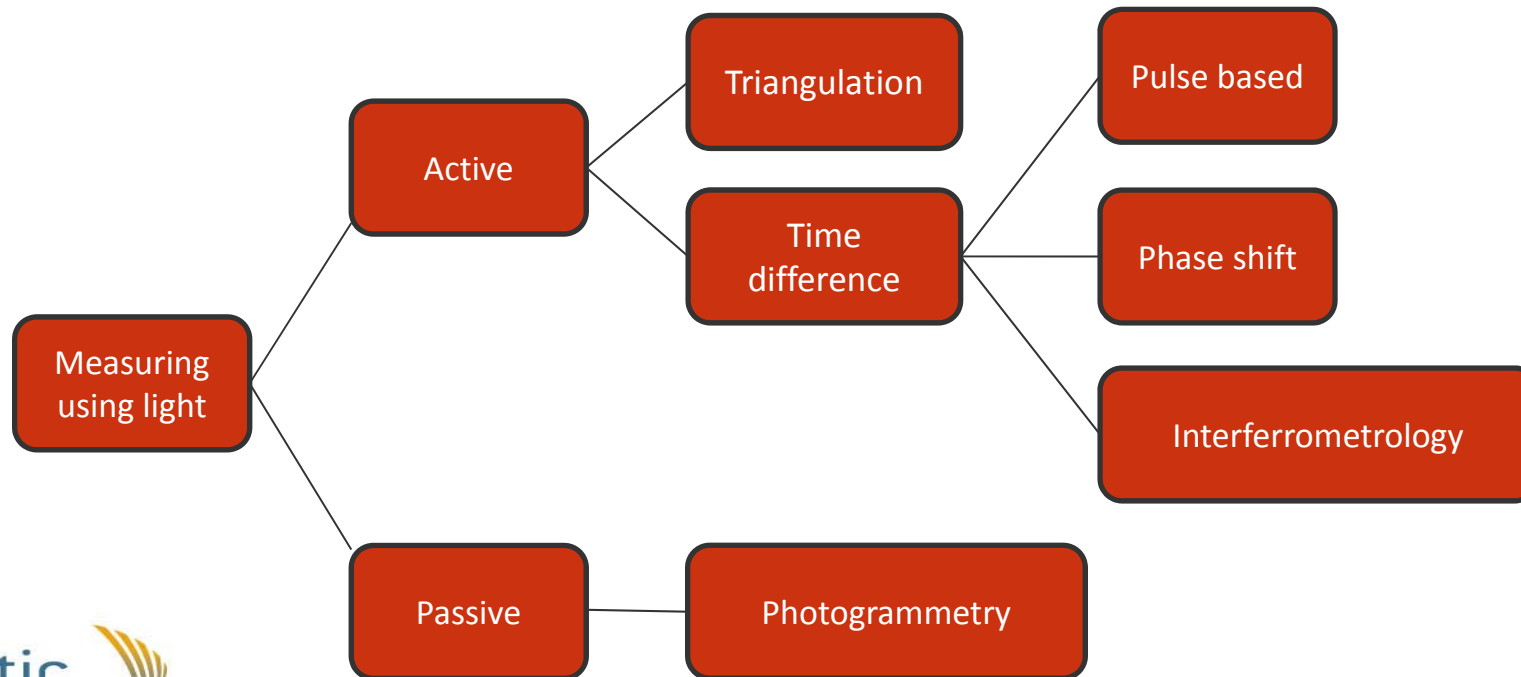
LE POINT SUR LE BIM 'BUILDING INFORMATION MODELING' VU PAR LES TECHNIQUES SPÉCIALES
EEN UPDATE OVER HVAC SPECIALE TECHNIKEN EN BUILDING INFORMATION MODELING (BIM)

WELKOM BIENVENUE



3D Statisch Laserscanning

Laserscannen : “active” survey technology using light



Static measurement devices



Mobile measurement devices



Type of scanners (1)

- Type 1 : Phase based
 - distance based on phase difference: no clock mechanism
→ continuously emit modulated laser beam
 - Characteristics:
 - Precision = f (measurement of phase difference)
 - Signal/noise ratio = f (1/distance)
 - Fast (continuous signal) = 1 000 000 points/s
 - 360° coverage in 3 to 15 minutes
 - Shorter distances: 0.5m to 150m (in practice limited to 30m to 50m)

Type of scanners (2)

- Type 2 : Pulse based
 - Distance based on time-of-flight
 - Characteristics:
 - Precision = f (measurement of time)
1mm = 6.67ps accuracy ! - distance > wavelength of Tpulse
 - Signal/noise ratio = f (1/distance)
 - Slower = 1 00 000 points/s
 - 360° coverage in 3 to 90 minutes
 - Longer distances: 0.5m to 300m (in practice limited to 200m)

Common characteristics

- density = f(distance to object)
- intensity = f(material + scan angle)
- speed = f(density + noise reduction)
- reflectivity = f(material + scan angle)
- wysiwyg: not “inside” objects

Applications

- clash-detection
- modelling industrial installations and equipment for engineering purposes
- volume calculation, as-built documentation
- deformation measurements
- buildings: throughout whole life cycle
- generation of documentation (sections, floor maps,...)

Pointcloud vs model

- Pointcloud: not intelligent
 - Use: position/volume/quantities
 - Specific viewers/software
- Conversion to “objects” → adding intelligence
 - Use:
 - asset management
 - Facility management
 - As built documentation
 - Specific software/databases

Model

- Specific software/databases to create models from pointcloud
 - LOD (Level of Detail)
 - LOI (Level of Intelligence)
 - Templates / classes

BIM

- Laserscanning is a powerful technique to use in BIM
 - Control measurements (position / quantity / ...)
 - Documentation (structure of a building / HVAC / routing of cables/...)
 - As built information for:
 - Renovation projects
 - Asset/Facility management
 - Volume calculation

Future challenges

- Standardisation: formats
- Control of data (enormous data sets → Gigabytes – Terabytes)
- Automodelling: create “intelligent” objects → new algorithms
- Rendering tools
- The cloud : sharing data (vs security)

Examples



Examples

