COSCH$^{KR}$: how does the inference work

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Technologies

- **Measurement Principles**
  - those actually responsible for data generation

- **Tools**
  - Instruments
    - based on measurement principles and responsible for data generations
  - Setups
    - setups with instruments and necessary accessories for optimal data generations

- **Data Processing**
  - post processing algorithms and tasks for end data product

- **Technical Process**
  - packages all technical components
Technologies: Principles

- Measurement Principles
  - Triangulations

- Angle Measurement / Distance Measurement

- Central Projection
Technologies: Principles

- Measurement Principles
  - Triangulations

- Angle Measurement / Distance Measurement

- Central Projection
Technologies: Instruments

• Main Hardware
  – Structured Light Scanner
    (Triangulation)
  – Laser Scanner
    (Distance/Angle Measurement)
  – Camera
    (Central Projection)
Technologies: Technical Process

- **Structured Light Scanning**
  (Structured Light Scanner)

- **Laser Scanning**
  (Laser Scanner)

- **Structure from Motion**
  (Camera)
Technologies: Technical Process

- Structured Light Scanning
  (Structured Light Scanner)

- Laser Scanning
  (Laser Scanner)

- Structure from Motion
  (Camera)
CH Application (Deformation Analysis)

Data (High Quality 3D Data)

Technology (Structured Light Scanning, Laser Scanning, SfM)
Technologies: Technical Process

- **Structured Light Scanning**
  Instrument: Structured Light Scanner
  Principle: Triangulation

- **Laser Scanning**
  Instrument: Laser Scanner
  Principle: Distance/Angle Msmnt

- **Structure from Motion**
  Instrument: Camera
  Principle: Central Projection
Technologies: Technical Process

- **Structured Light Scanning**
  - Instrument: Structured Light Scanner
  - Principle: Triangulation
  - Quality – High

- **Laser Scanning**
  - Instrument: Laser Scanner
  - Principle: Distance/Angle Measurement
  - Quality – High

- **Structure from Motion**
  - Instrument: Camera
  - Principle: Central Projection
  - Quality – High
CH Application **(Deformation Analysis)**

Data **(High Quality 3D Data)**

Technology **(Structured Light Scanning, Laser Scanning, SfM)**
USERS INPUTS
CH Application *(Deformation Analysis)*

Data *(High Accuracy 3D Data)*

Technology *(Structured Light Scanning, Laser Scanning, SfM)*

Objects
- Size: Small
- Reflectivity:
- Quantity:
- Texture:
- Condition:
Technologies: Instruments

- **Main Hardware**
  - Structured Light Scanner

- **Laser Scanner**

- **Camera**
Technologies: Instruments

- **Main Hardware**
  - **Structured Light Scanner**
  - **Laser Scanner**
  - **Camera**

Suitability: Small Objects

- Suitable for some (PhysicalThing and (hasObjectSize some 2DSize_Small) or (hasObjectVolume some 3DVolume_Small))

Suitability: Large Objects

- Suitable for some (PhysicalThing and (hasObjectVolume some (3DVolume_Big or 3DVolume_Medium) or 3DVolume_Small)))
Technologies: Instruments

- Main Hardware
  - Structured Light Scanner
- Laser Scanner
- Camera
Technologies: Technical Process

- **Structured Light Scanning**
  (Structured Light Scanner)

- **Laser Scanning**
  (Laser Scanner)

- **Structure from Motion**
  (Camera)
CH Application (Deformation Analysis)

Data (High Quality 3D Data)

Technology (Structured Light Scanning, Laser Scanning, SfM)

Objects
Size: Small
Reflectivity:
Quantity:
Texture:
Condition:
CH Application **(Deformation Analysis)**

Data **(High Accuracy 3D Data)**

Technology **(Structured Light Scanning, Laser Scanning, SfM)**

Objects
- Size: Small
- Reflectivity:
- Quantity:
- Texture: Non-Textured
- Condition:
Technologies: Instruments

- **Main Hardware**
  - Structured Light Scanner

- **Laser Scanner**

- **Camera**
Instruments: Operating Nature

- Active

- Passive
Instruments: Operating Nature

- Active

- Passive
Technologies: Instruments

- Main Hardware
  - Structured Light Scanner
- Laser Scanner
- Camera
Technologies: Technical Process

- **Structured Light Scanning**
  (Structured Light Scanner)

- **Laser Scanning**
  (Laser Scanner)

- **Structure from Motion**
  (Camera)
Technologies: Technical Process

- **Structured Light Scanning**
  (Structured Light Scanner)

- **Laser Scanning**
  (Laser Scanner)

- **Structure from Motion**
  (Camera)
**CH Application** *(Deformation Analysis)*

**Data** *(High Quality 3D Data)*

**Objects**
- Size: Small
- Reflectivity:
- Quantity:
- Texture: Non-Textured
- Condition:

**Technology** *(Structured Light Scanning, Laser Scanning, SfM)*
CH Application (Deformation Analysis)

Data (High Quality 3D Data)

Technology (Structured Light Scanning, Laser Scanning, SfM)

Objects
Size: Small
Reflectivity: High
Quantity:
Texture: Non-Textured
Condition:
Technologies: Principles

- **Triangulations**
  - Structured Light Scanner – Structured Light Scanning
- **Angle/Distance Measurements**
  - Laser Scanner – Laser Scanning
- **Central Projection**
  - Camera – Structure from Motion
Technologies: Principles

- Triangulations
  - Structured Light Scanner – Structured Light Scanning
- Angle/Distance Measurements
  - Laser Scanner – Laser Scanning
- Central Projection
  - Camera – Structure from Motion

High Reflectivity: Low Quality
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CH Application (Deformation Analysis)

Data (High Accuracy 3D Data)

Technology
(Structured Light Scanning, Laser Scanning, SfM)

Conflicts!!!

Objects
Size: Small
Quantity: Non-Textured
Reflectivity: High
Condition: Fragile
Technologies: Principles

• Triangulations
  – Structured Light Scanner – Structured Light Scanning

• Angle/Distance Measurements
  – Laser Scanner – Laser Scanning

• Central Projection
  – Camera – Structure from Motion
CH Application **(Deformation Analysis)**

Data **(High Quality 3D Data)**

Technology **(Structured Light Scanning, Laser Scanning, SfM)**

**Objects**
- Size: Small
- Reflectivity: Low
- Quantity:
- Texture: Non-Textured
- Condition:
CH Application (Deformation Analysis)

Data (High Quality 3D Data)

Technology (Structured Light Scanning, Laser Scanning, SfM)

Objects
Size: Small
Reflectivity: Low
Quantity: Large
Texture: Non-Textured
Condition:
Technologies: Instruments

- Structured Light Scanners
  - Automated / Semi-Automated Workflow

- Automated / Semi-Automated Workflow
  - Suitable for large numbers of object
Technologies: Instruments

- Structured Light Scanners
  - Automated / Semi-Automated Workflow

- Automated / Semi-Automated Workflow
  - Suitable for operating staff competency: Low
CH Application (Deformation Analysis)

Data (High Accuracy 3D Data)

External Influences
- Project Staff Competence: Low

Technology (Structured Light Scanning, Laser Scanning, SfM)

Objects
- Size: Small
- Reflectivity: Low
- Quantity: Large
- Texture: Non-Textured
- Condition: Fragile

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Technologies: Technical Process

• **Fragile**
  - No internal markers

• **Structured Light Scanning**
  - Setup with Markers
    - Generates highly accurate data
Technologies: Technical Process

- **Setup with Markers**
  - Needs at least 5 internal markers

- **Object – Fragile**
  - No internal Marker Possible
CH Application  (Deformation Analysis)

Data (High Accuracy 3D Data)

External Influences

Project

Staff Competence: Low

Technology

(Structured Light Scanning, Laser Scanning, SfM)

Objects

Site: Small

Reflectivity: Low

Quantity: Large

Texture: Non-Textured

Condition: Fragile

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CH Application (Deformation Analysis)

Data (High Quality 3D Data)

External Influences

Project
Staff Competence: Low

Technology
(Structured Light Scanning, Laser Scanning, SfM)

Objects
Size: Small
Reflectivity: Low
Quantity: Large
Texture: Non-Textured
Condition: Fragile but internal markers possible