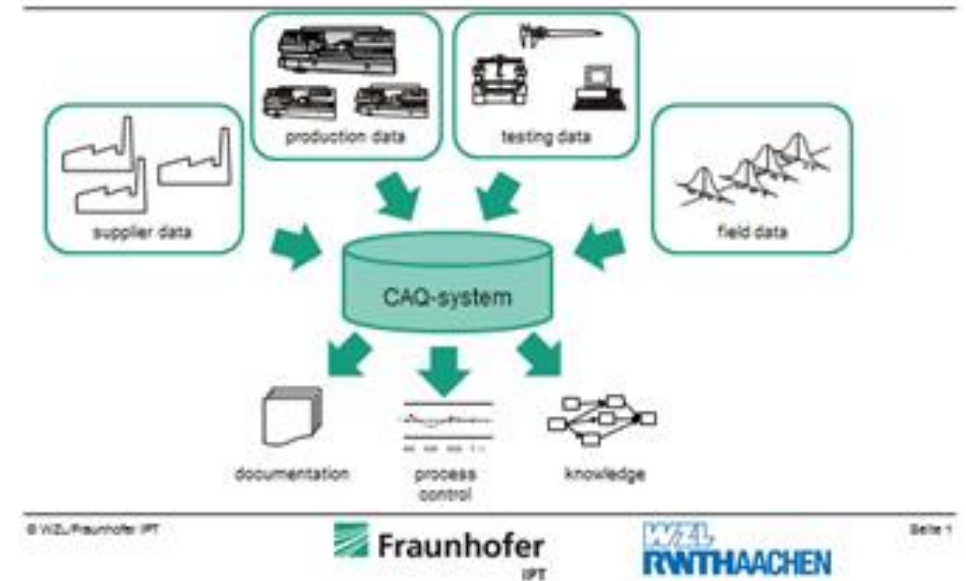**FAKULTET TEHNIČKIH NAUKA**
KOSOVSKA MITROVICA

Modern coordinate metrology

Milan Blagojević, asistent
Kosovska Mitrovica, mart 2022
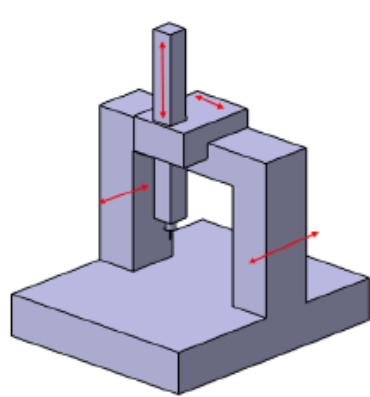
Lesson 1 (2 hours):

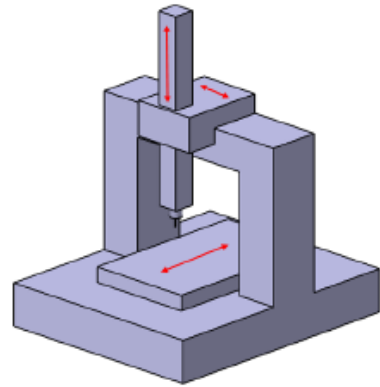**Lesson title: Introduction to metrology**
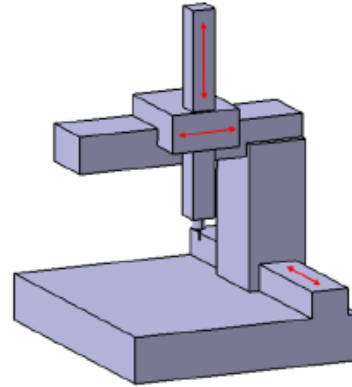
Lesson 2 (2 hours):
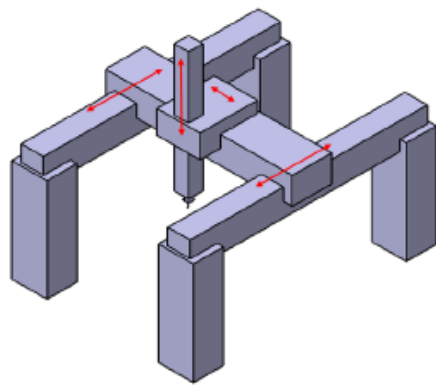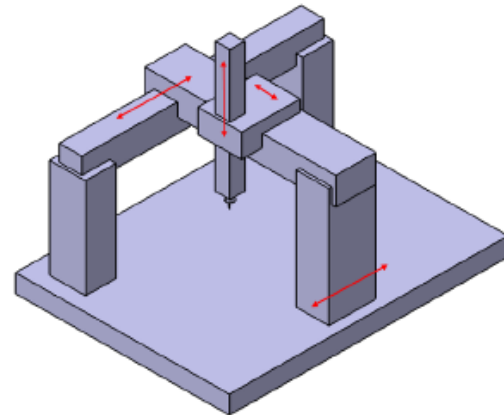
Lesson title: Coordinate Measuring Machines
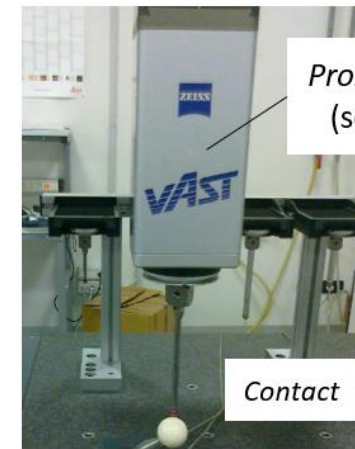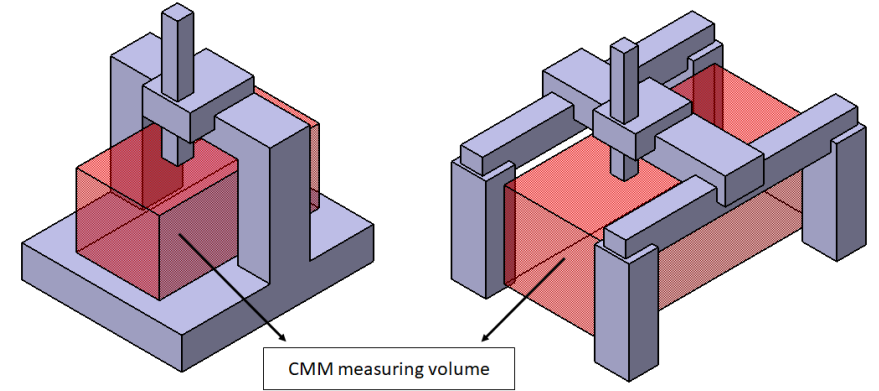

Moving-bridge CMM   Fixed-bridge CMM   Cantilever CMM

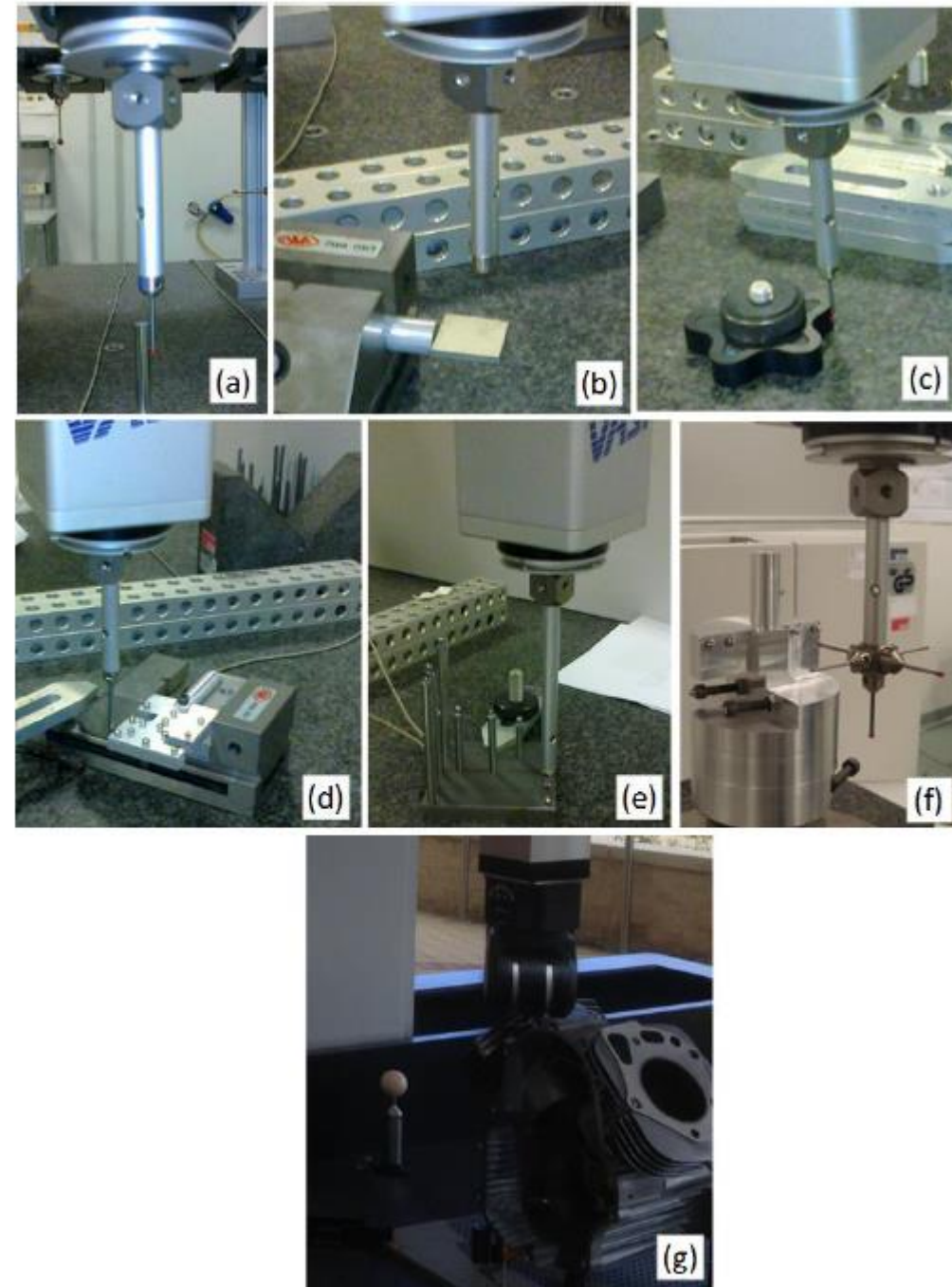Gantry CMM   L-Shaped CMM

CMM measuring volume
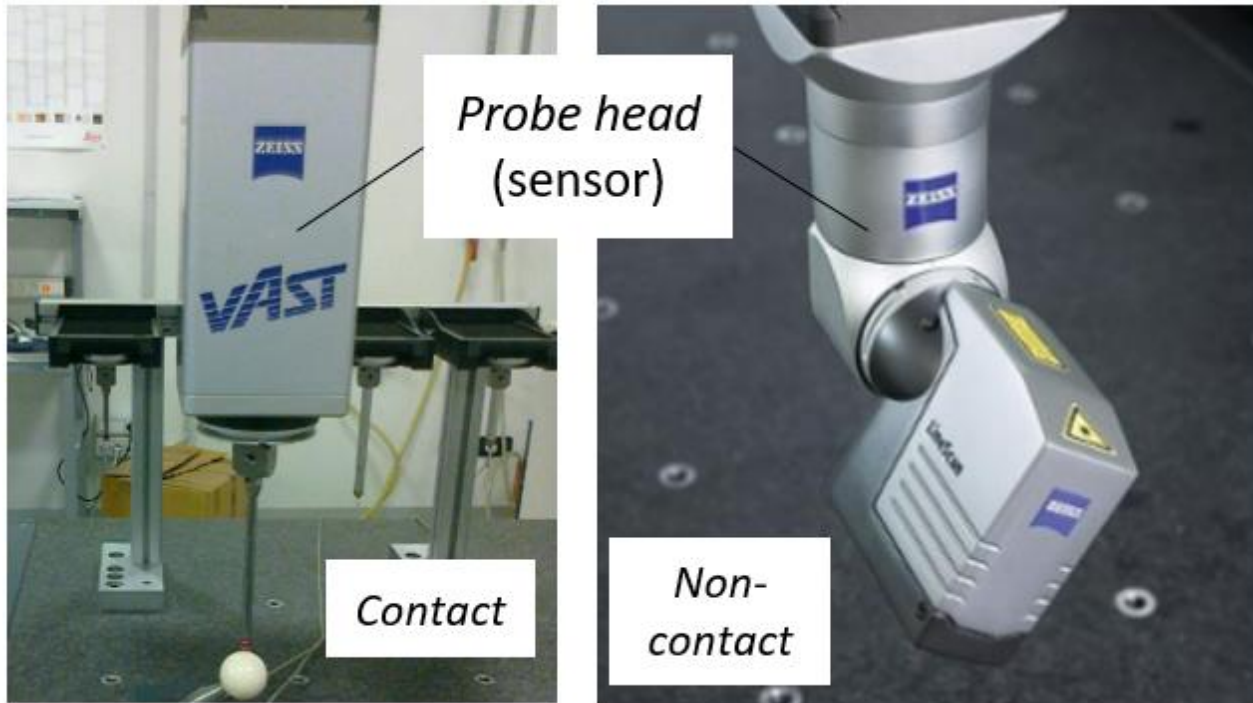
Probe head (sensor)

Contact   Non-contact

Lesson 2 (2 hours):

Lesson title: Coordinate Measuring Machines

Lesson 2 (2 hours):
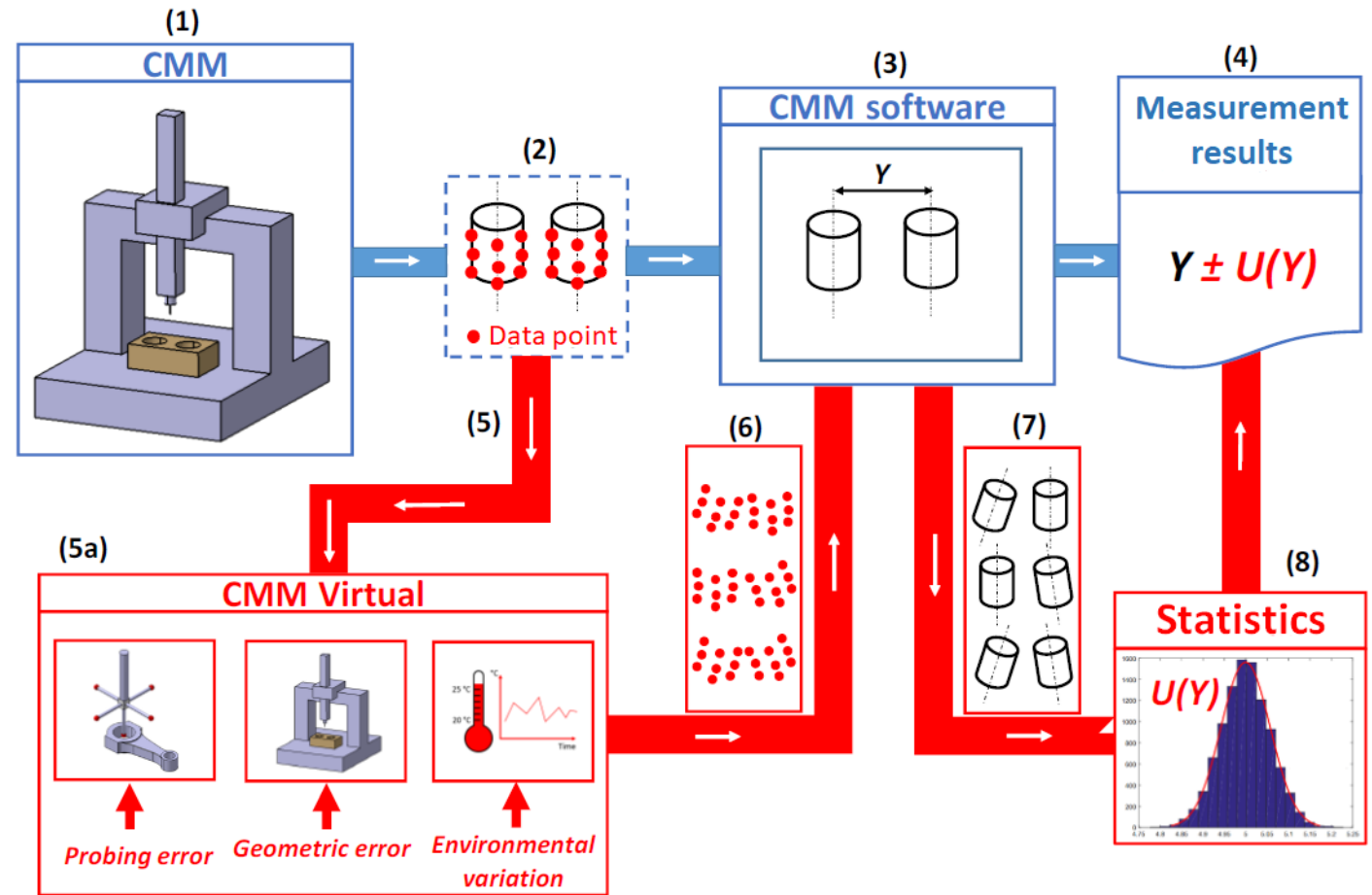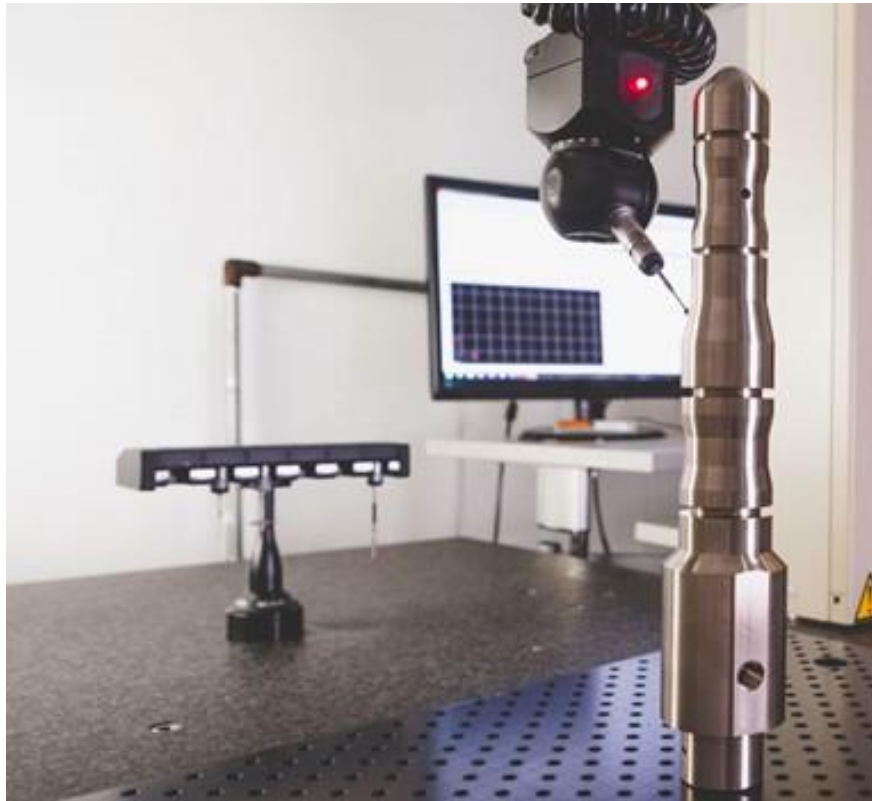
Lesson title: Coordinate Measuring Machines

Illustration of measurement uncertainty based on Monte-Carlo (MC) simulation (ISO 15530-4)

Lesson 3 (4 hours):

Lesson title: Portable CMM

Lesson 3 (4 hours):

Lesson title: Portable CMM

Lesson 3 (4 hours):

Lesson title: Portable CMM

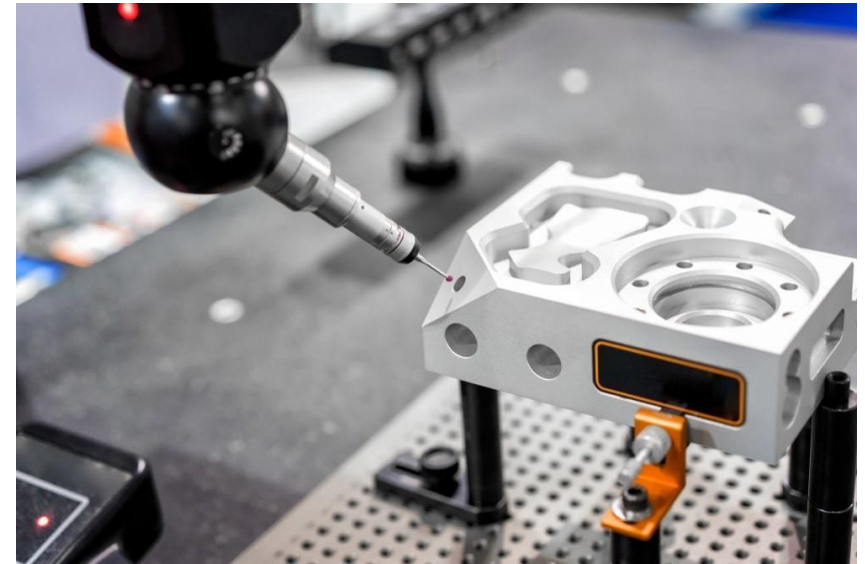# Lesson 3 (4 hours):
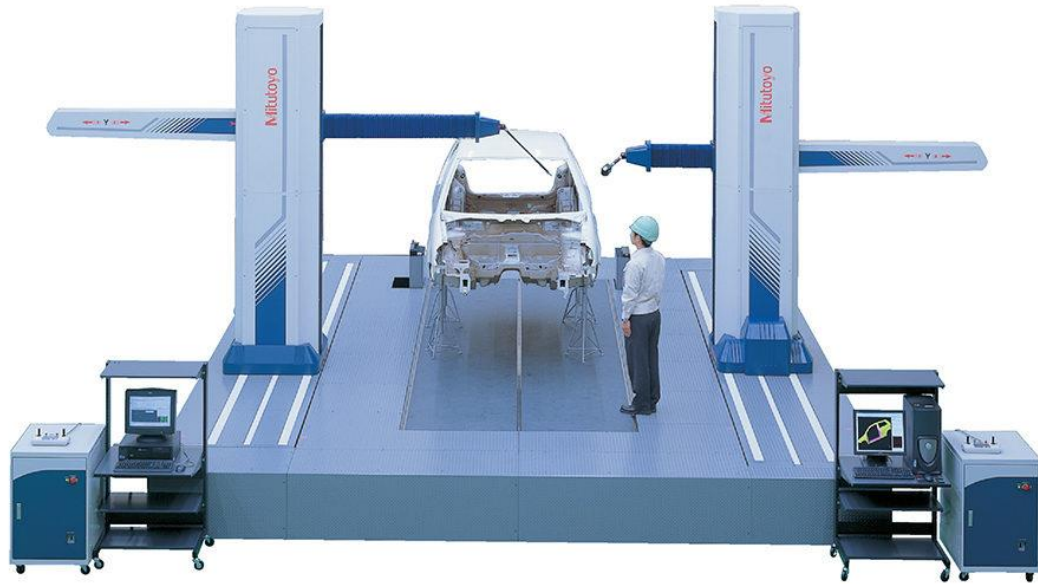
Lesson title: Portable CMM

Lesson 4 (2 hours):

Lesson title: Stationary CMM

Lesson 4 (2 hours):

Lesson title: Stationary CMM

Lesson 5 (4 hours):

Lesson title: Systems for optical 3D digitization

Lesson 5 (4 hours):

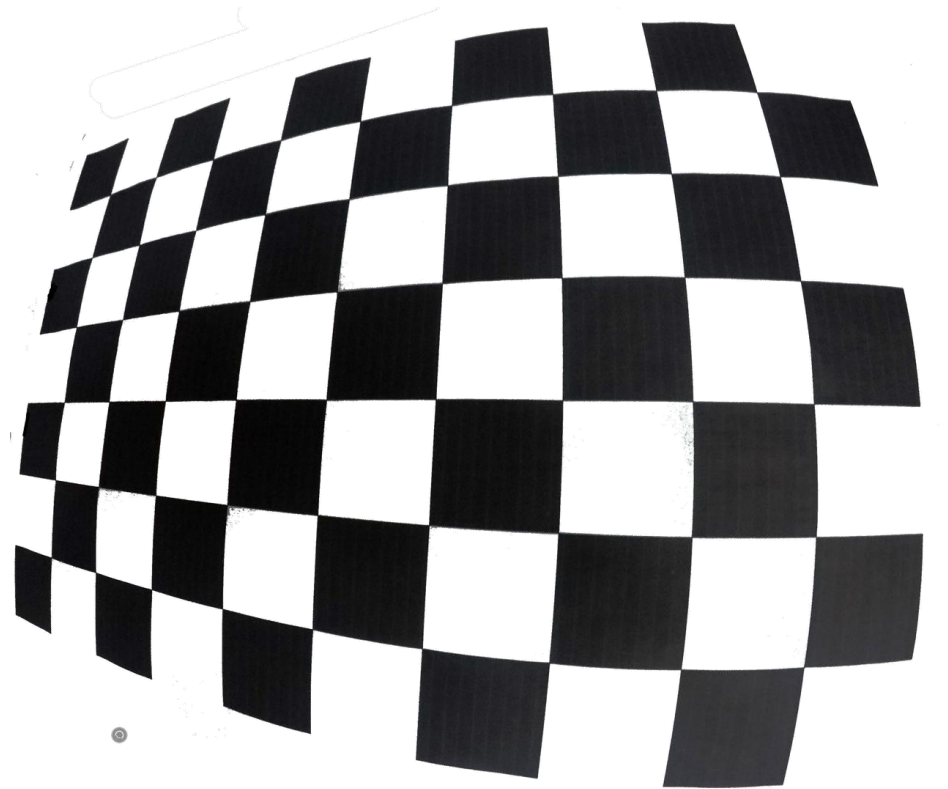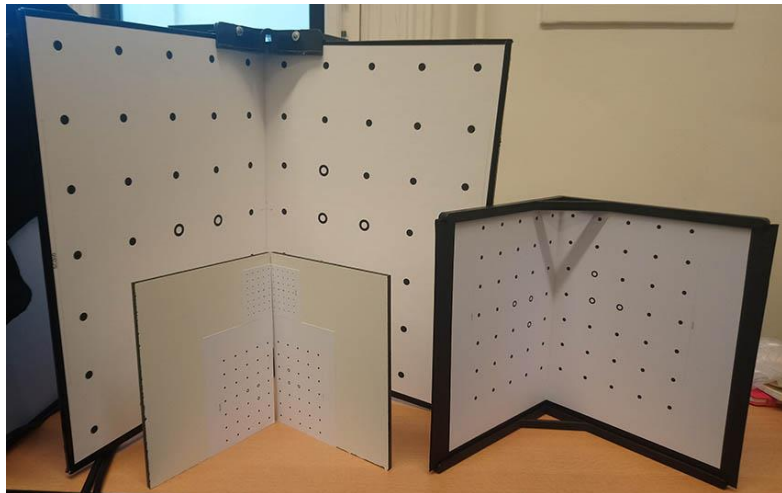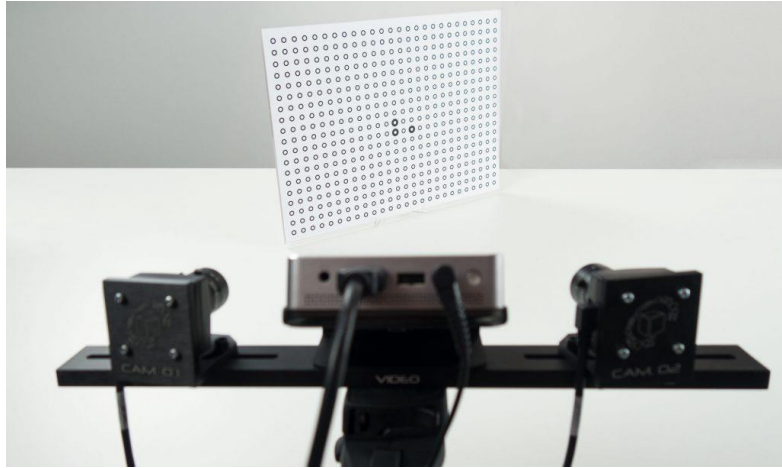**Lesson title: Systems for optical 3D digitization**
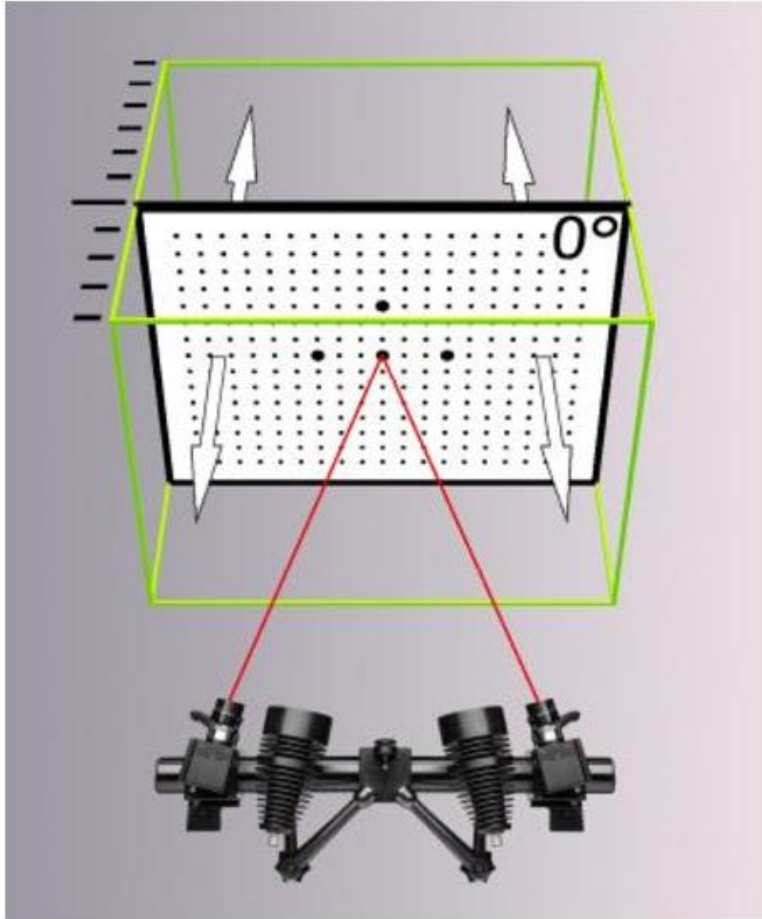
Lesson 5 (4 hours):

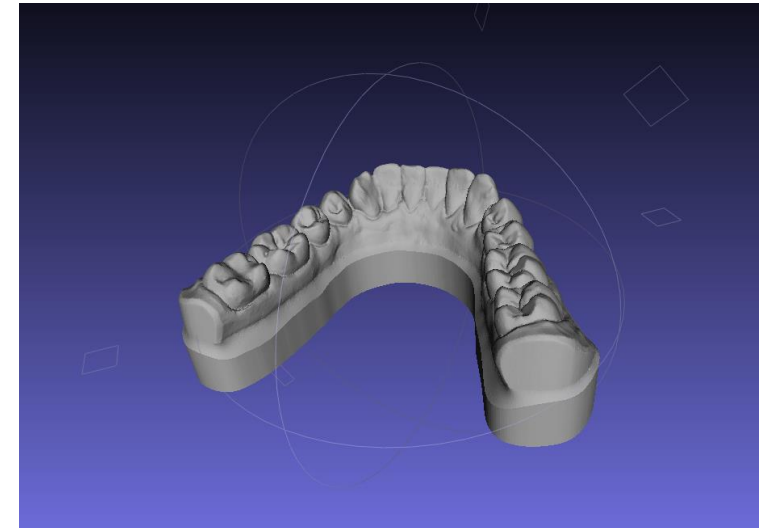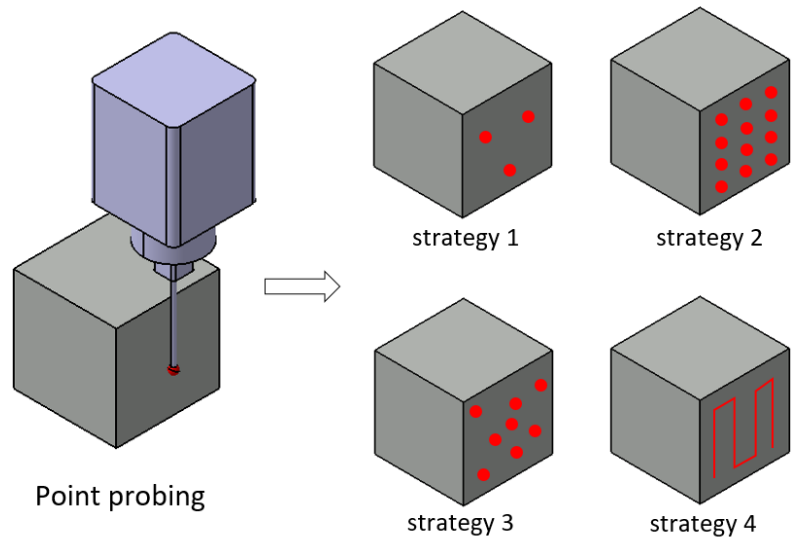## Lesson title: Systems for optical 3D digitization

Lesson 5 (4 hours):

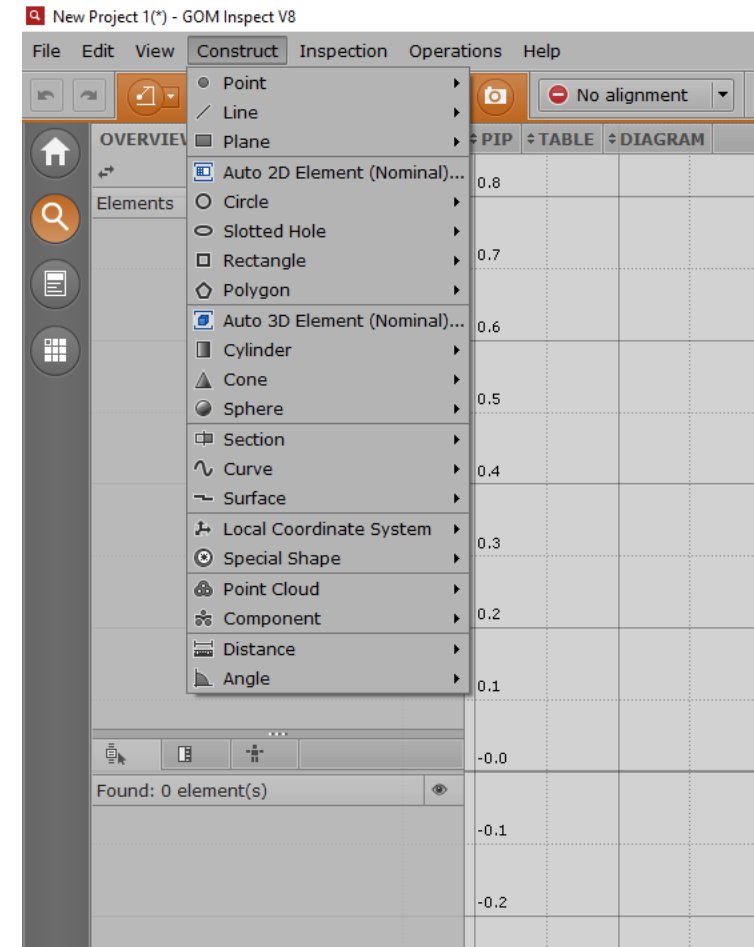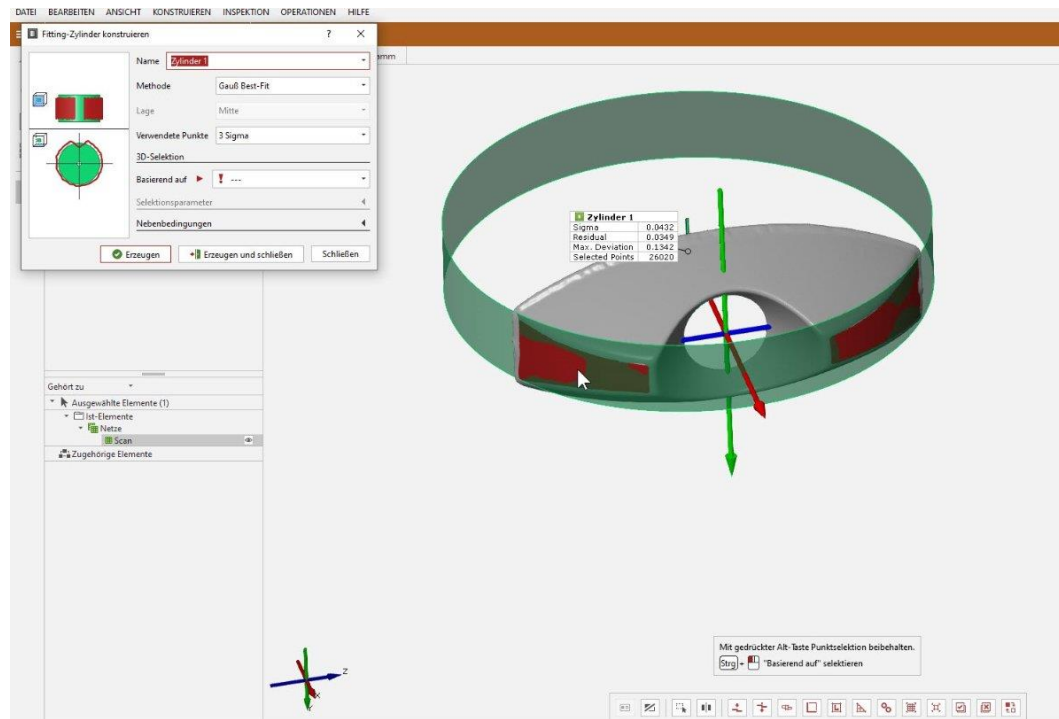## Lesson title: Systems for optical 3D digitization

Lesson 6 (2 hours):

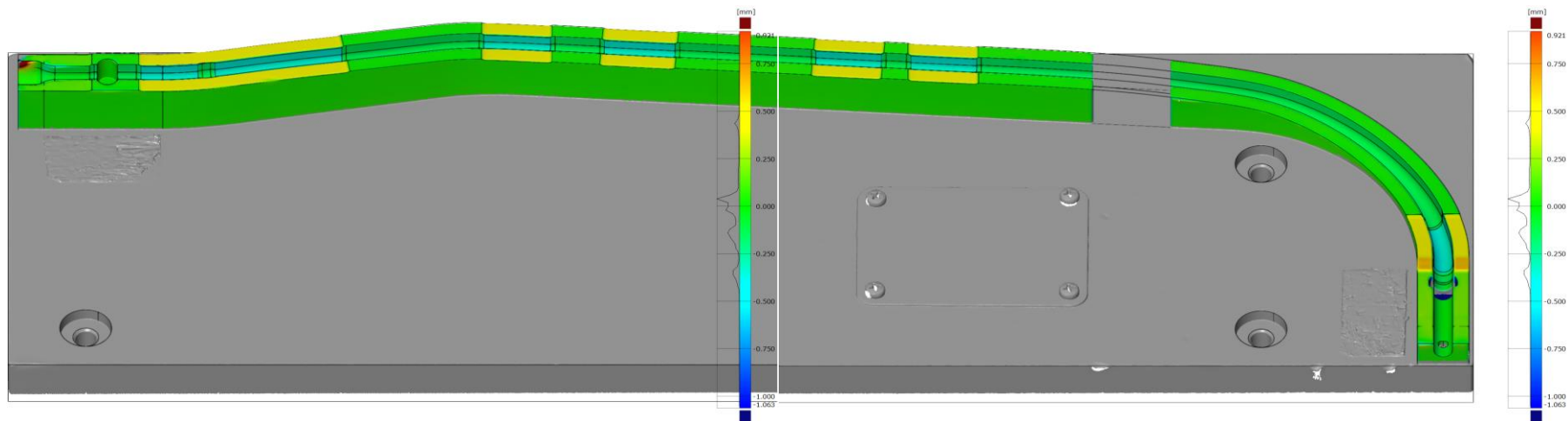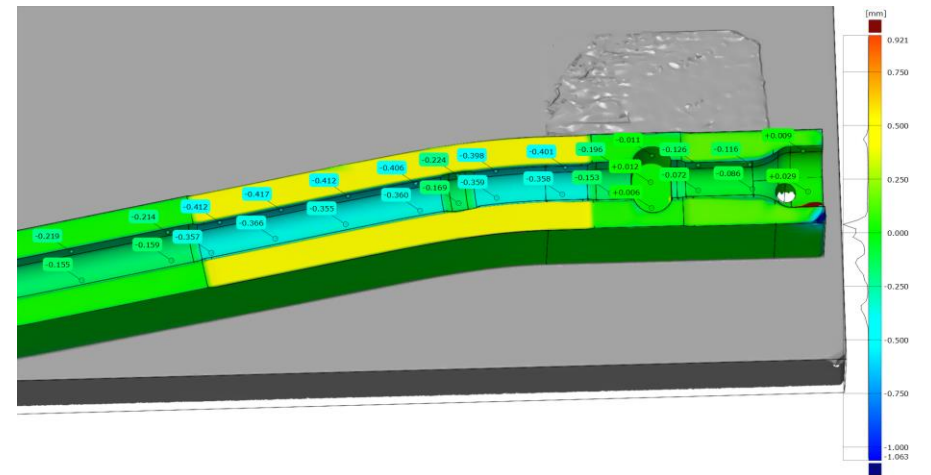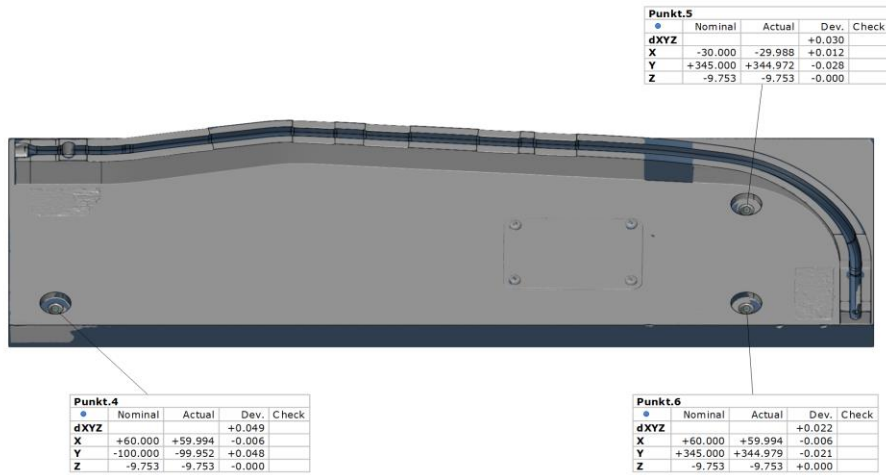## Lesson title: Measurement data: Discrete measurement points, point cloud and polygonal model

Lesson 7 (2 hours):

Title of the lesson: Basic geometric entities. Transformation and registration

Lesson 8 (4 hours):

Title of the lesson: Examples of simple measurement projects

Punkt.5

	Nominal	Actual	Dev.	Check
dXYZ			+0.030	
X	-30.000	-29.988	+0.012	
Y	+345.000	+344.972	-0.028	
Z	-9.753	-9.753	-0.000	

Punkt.4

	Nominal	Actual	Dev.	Check
dXYZ			+0.049	
X	+60.000	+59.994	-0.006	
Y	-100.000	-99.952	+0.048	
Z	-9.753	-9.753	-0.000	

Punkt.6

	Nominal	Actual	Dev.	Check
dXYZ			+0.022	
X	+60.000	+59.994	-0.006	
Y	+345.000	+344.979	-0.021	
Z	-9.753	-9.753	+0.000	

Lesson 9 (2 hours):

Title of the lesson: Geometric Dimensioning and Tolerancing (GD&T)
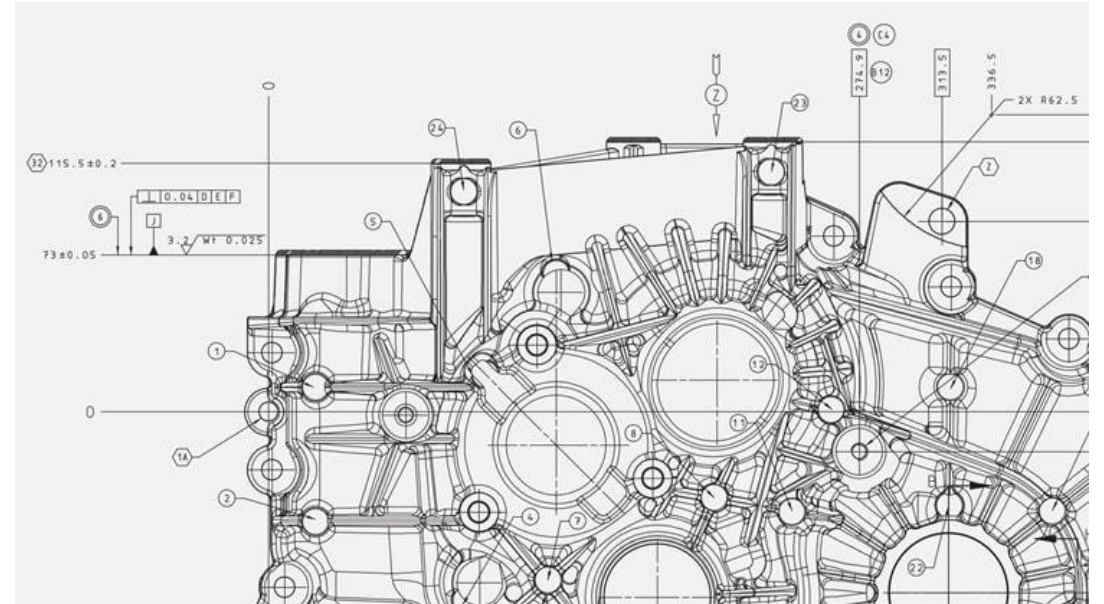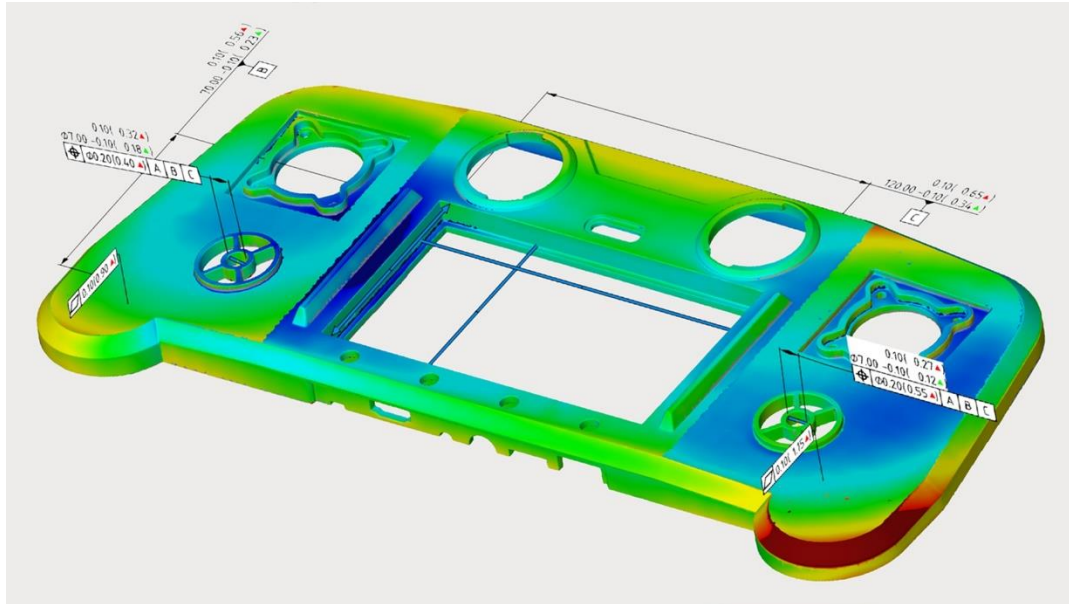
GD&T Standards:
ISO GPS (geometric product specification), established by the International Organization for Standardization
ASME Y14.5, established by the American Society of Mechanical Engineers