Halmstad

- Founded 1307
- Population 80,000
- Capital of the province Halland

Halmstad University's Ratios

- 14,916 students
- 6,161 full-time students
- 81 percent performance indicator
- 623 employees
  - 40 professors
  - 82 PhD students
  - 58 percent teachers with PhD degree
- 85 programmes (undergraduate and graduate programmes, Master’s programmes)
- 400 courses
- Turnover TOTAL 492 million SEK
- Turnover EDUCATION 394 million SEK
- Turnover RESEARCH 98 million SEK, of which 50 percent is external funding
The Functional Surfaces' Research Group

Research staff:
- prof. B.-G. Rosén, manager
- prof. L.B. Bååth
- PhD Hans Löhgren, senior researcher
- PhD Bertil Nilsson, senior researcher
- PhD Frederic Cabanettes, research assistant
- PhD Zlate Dimkovski, research assistant
- Visiting prof. T.R. Thomas
- Visiting prof. L. Blunt
- Visiting prof. H. Zahouani
- Visiting prof. P. Hansbo
- PhD student 1 Sabina Rebeggiani, Lic.Eng
- PhD student 2 Cecilia Anderberg, Lic.Eng
- PhD student 3 Staffan Johansson, Lic.Eng
- PhD student 4 Per Jonsson, Lic. Eng
- PhD student 5 Magnus Liljegren, MSc
- PhD student 6 Martin Bergman, MSc
- PhD student 7 Pär-Johan Lööf, MSc

* 4 industrial Co-supervisors:
- Dr. R.Ohansson, Volvo Powertrain
- Dr. N. Amrin, Gehag
- Dr. Li Xiao, GM
- Dr. O. Wiklund, SWEREA-IVF, Lic. Eng

Our “core” assets
Functional surfaces…

The Business idea

Function Manufacturing

Characterization

Scale...

VLBI 5 GHz

VLBI 100 GHz

Cylinder liner
Cold Neutron Tomography
PSI-CH

Automotive Engines

Oil Consumption
FEATURE RECOGNITION USING IMAGE ANALYSIS

Parameters specific for liner surfaces

- Groove balance
- Groove width
- Distance between grooves

- Axial-sliding direction

Blechmantel
Irregularities
Holes
Valleys

CAM-ROLLER optimization

- Centerless polished
- Honing
- Tumbling

- Isotropic finishing
- Tumbling with past

% of plastically deformed peaks for different manufacturing processes of rollers

- Honing
- Tumbling
- Centerless polished

Electro-plastic results
Surface preparation and characterization of tool surfaces

ChallengeS

Steel-producer
Designer (part & mould)
Mould maker
Polisher
Mould-user
Customer
End-user

Polishing Robot
Polishing Laser

Wave Structure:
- Area: 18 x 24 mm²
- Height: 50 µm
- λ: 1 mm

Burling Structure:
- Area: 18 x 24 mm²
- Height: 50 µm
- λ: 1 mm

Leather Texture:
- Area: 15 x 15 mm²
- Height: 50 µm
- λ: non-periodic

POLISHING

Experience
Process strategy
Force control
Path planning
Quality control

Process know-how
Control
Polarization interferometer

White light interferometer

Resolution:
Plane 2 μm/pixel
Depth 0.2 nm

Field of View (FOW):
Plane 4x5 mm
Range 5 μm
Robot Polishing RA scatter plot.