

VIAS Capabilities – Lifestyle

September, 2021

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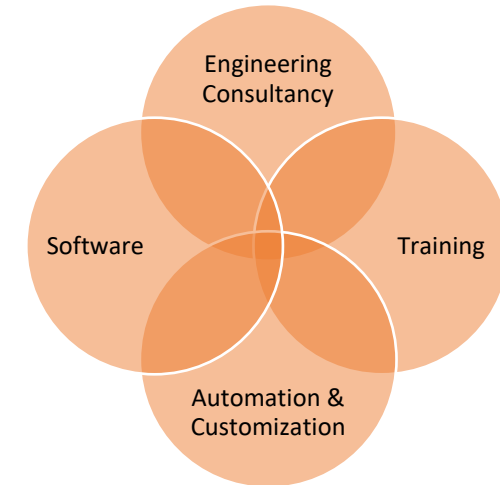


www.VIAS3D.com

<https://vias3d.com/services/>
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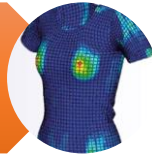
Who We Are

- Multiple Industry Experience – Lifestyle, CPG, Medical, Machinery & Equipment, Manufacturing, and other industries.
- Global Presence with HQ in Houston, USA
- Team consists of +50 employees with 7 PhD's and 7 MSc/MTech's in Design, Manufacturing, Structural Mechanics, Fluid Mechanics, Electromagnetics, Optimization & Reliability, Data Analytics, System and Hardware Architecture
- Dassault Systèmes Platinum Partner
- Provide Engineering and PLM Consultancy, Training, Software Sales and Support, Automation and Customization

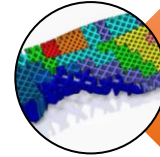


Simulation and Numerical Capabilities

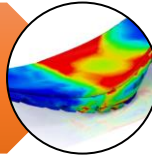
Clothing



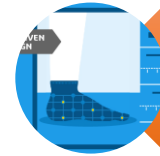
Additive Manufacturing



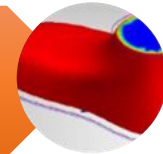
Footwear



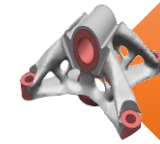
Digital Twin and Machine Learning



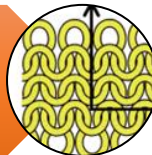
Thermal Analysis



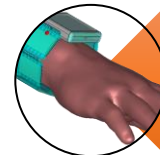
Function Driven Generative Design



Materials Modeling
(Fabric...)



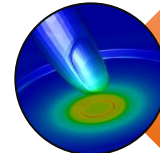
RFID/IOT Devices



Garment Comfort



Sensors



Optimization and
Reliability



Simulation Automation



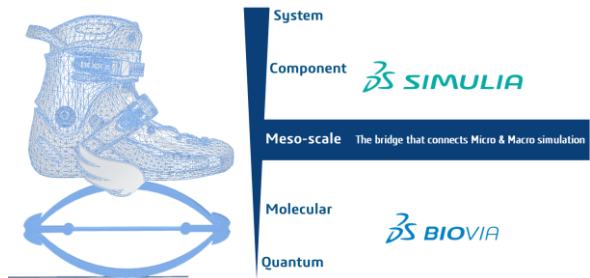
Why VIAS?

- Prompt and complete technical solutions
- Experts with knowledge of industry applications and software solutions
- Rich technical consulting experience & Software Agnostic
- Knowledge transfer through training services
- Adherence to strict quality control (ISO 9001: 2015 Compliant)
- Flexible pricing / startup discounts
- One Stop Shop – CAD / FEA / CFD / EMAG / GUI / Root-Cause / Optimization

FEA and Structural Simulation- Capabilities

FEA for Footwear

Better product DESIGN and INSIGHT

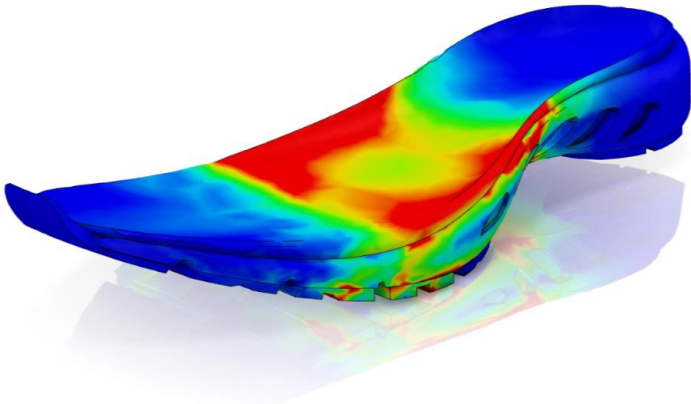


Material Modeling

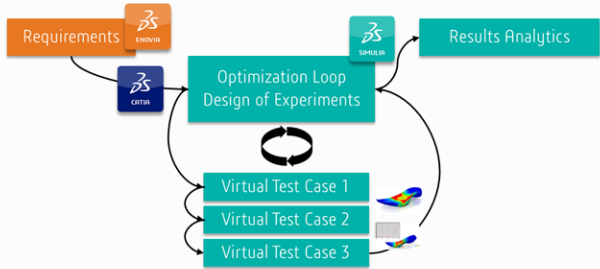
Integration and link to Enterprise



Virtual Testing

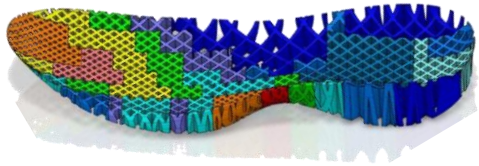
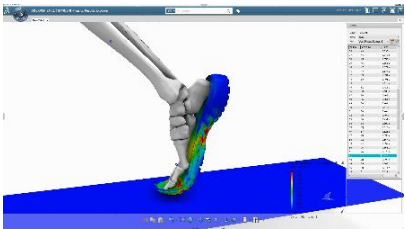


Optimization



Biomechanics

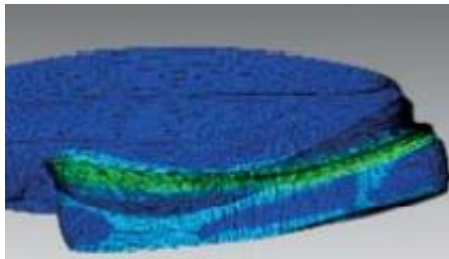
Additive Manufacturing



FEA for Footwear Midsole

Key Benefits from FEA simulation

- Reduced time-to-market
- Optimized researched innovation process
- Reduced R&D and development costs
- De-risked design process.
- Increased productivity, and profit.
- Enhanced design and early evaluation of critical design parameters.
- Efficient and less expensive design cycles



What can be achieved ?

- ✓ Midsole Design Optimization
- ✓ Prediction of optimum material stiffnesses
- ✓ Stress reduction at hotspots

FEA for Clothing

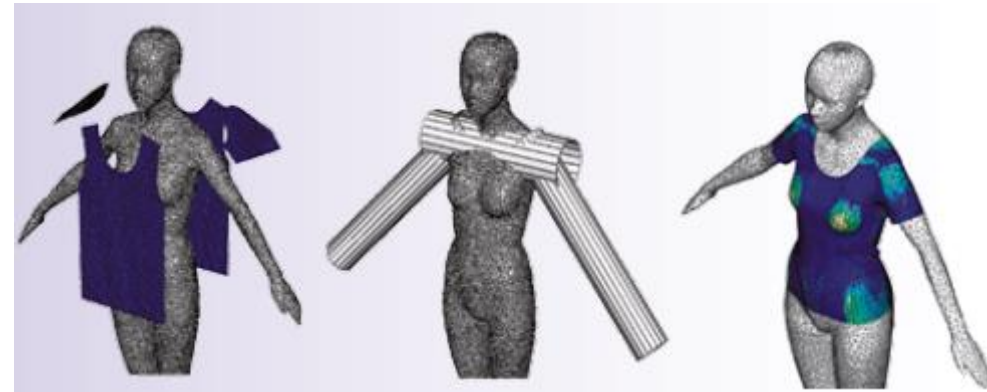
Types of Clothing in Simulation

- Underwear
- Sportswear
- Pantyhose
- Undershirt
- Etc.



What can be achieved ?

- ✓ Optimized clothing contact pressure
- ✓ Thermal characteristics
- ✓ Moisture transfer of fibers and textiles



“The company estimates that by using simulation it reduced the time and cost of their product design process by as much as 80 to 90 percent.” – Dassault Systems

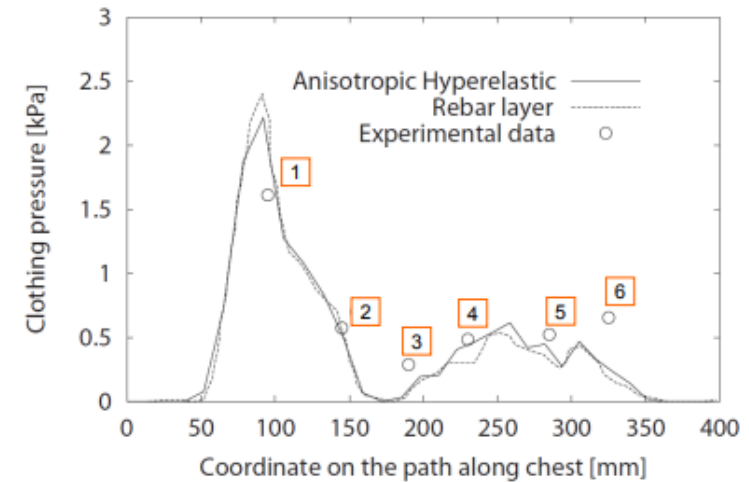
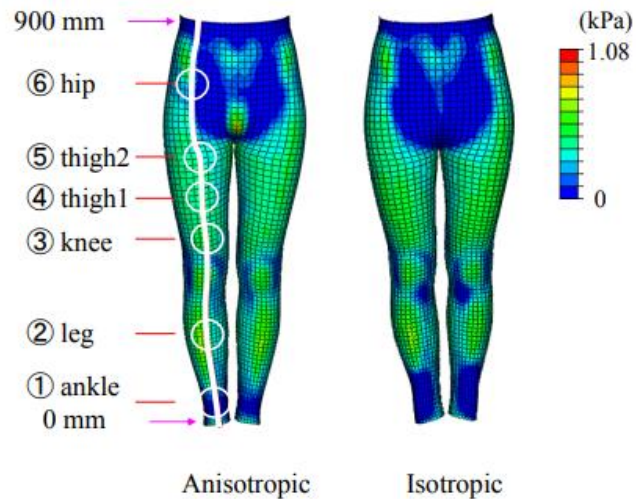
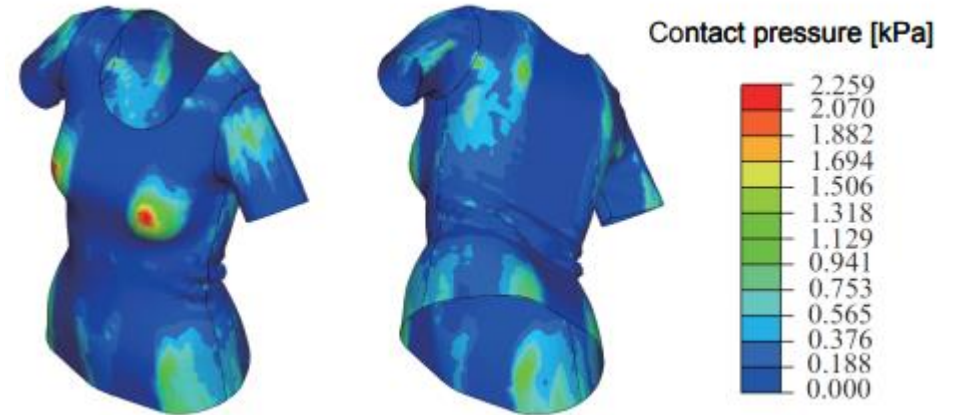
FEA Fabrics Material Models

Types of Fabrics

- Polyester
- Polyolefin
- Wool
- Cotton
- Etc.

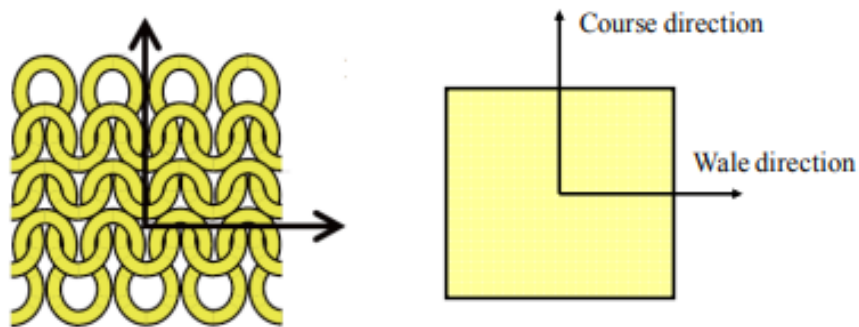
Fabrics Material Models Available

- ✓ rebar layer model
- ✓ anisotropic hyperplastic model
- ✓ composite modeling

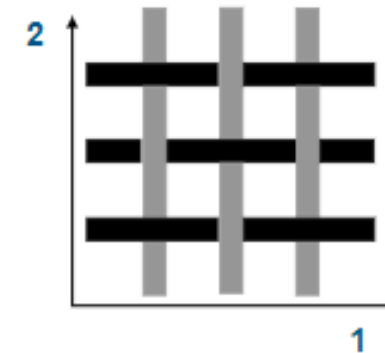


FEA Woven Fabric

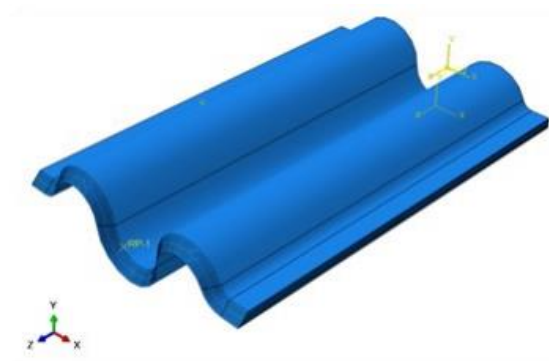
- The fiber direction are assumed to be and to remain orthogonal
- The fabric reinforced ply is modeled as a homogenous orthotropic elastic material
- Constitutive model for fabric reinforced composites with bi-lamina, shear plasticity, and damage
- The material response along the fiber direction is characterized with damaged elasticity.



Schematic model of fabric



Woven fabric: fibers are aligned with local 1 and 2

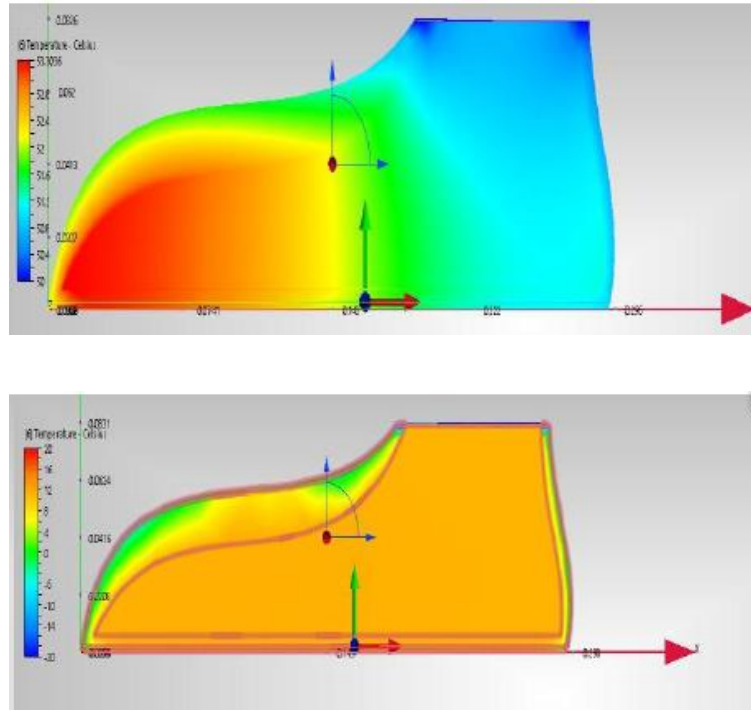


Fabric composite plate

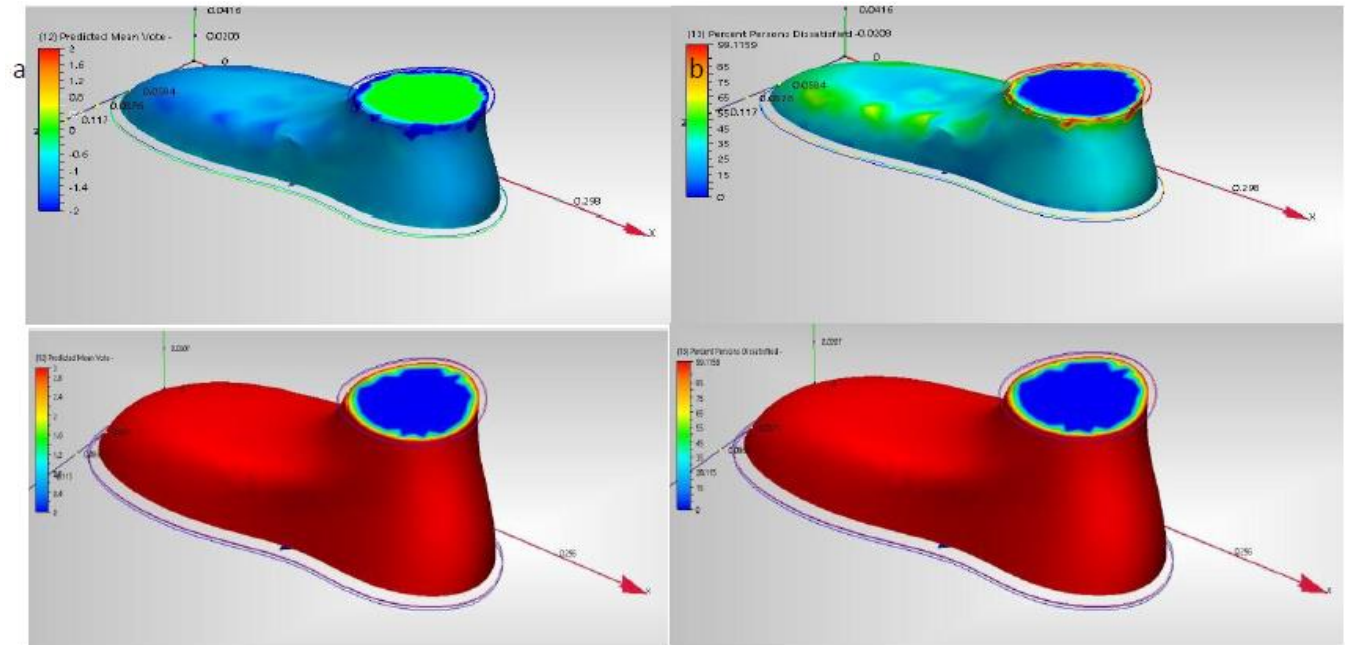
CFD - Capabilities

Thermal Comfort of Footwear

- Investigate the flow and temperature distribution across the footwear for hot and cold weather conditions.
- Improve the effectiveness of the footwear design by keeping the human foot comfortable in different weather conditions.



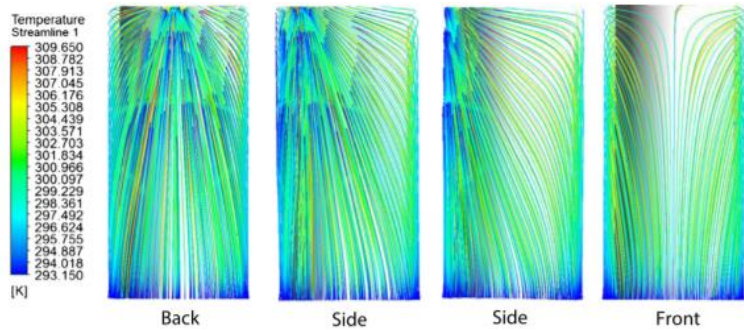
Temperature distribution cut plane for hot and cold country



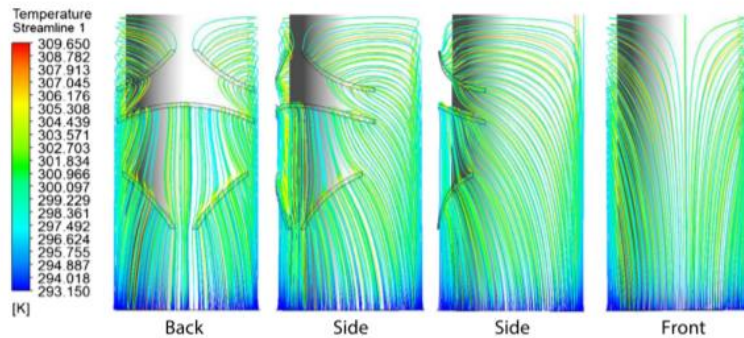
Comparison of (a) PMV and (b) PPD among two different temperature regions

Garment Design

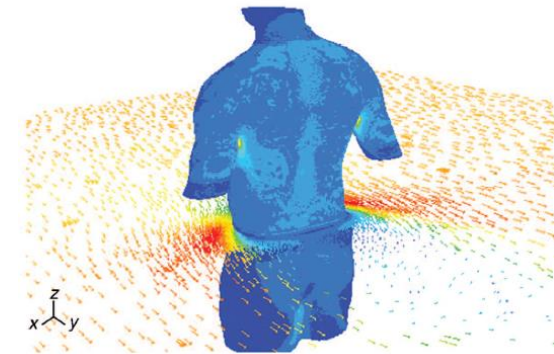
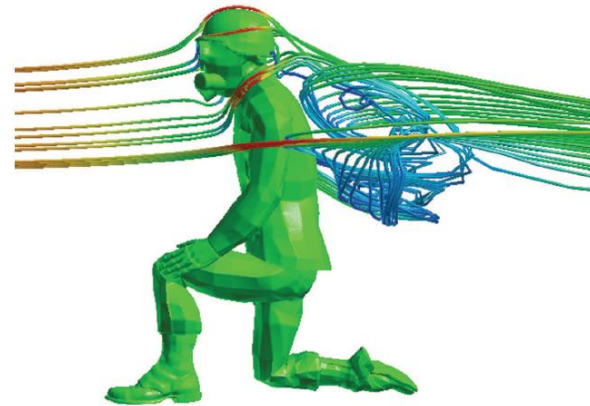
- Flow and thermal modeling for designing more comfortable protective clothing systems.
- Predict heat and moisture transport through garments at the extreme conditions



(A) Without slits.



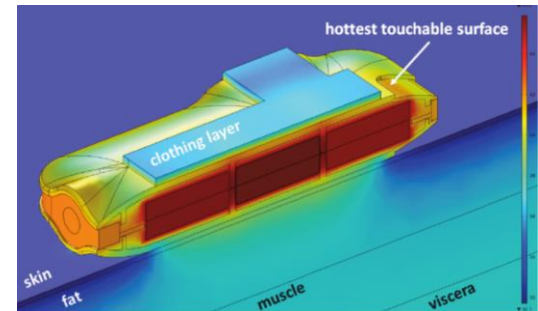
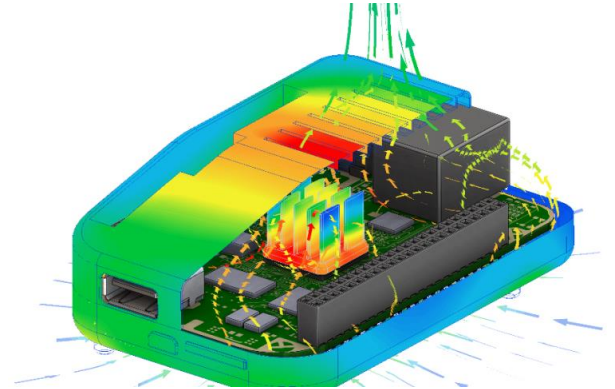
(B) With slits.



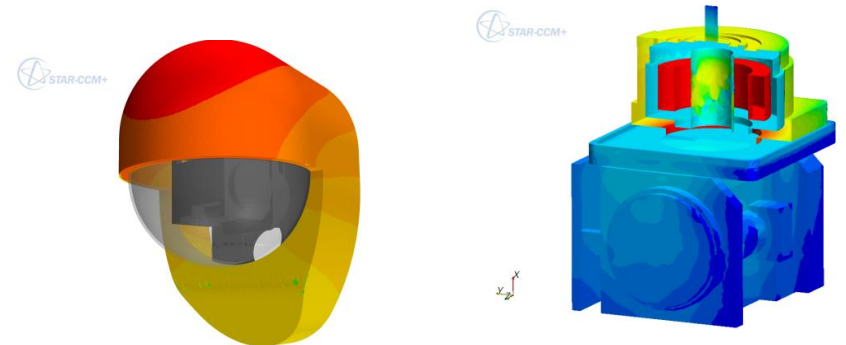
Air flow path and temperature distribution

Thermal Design of Electronic Products

- Multi-material heat transfer
- All cooling approach
- Conduction
- Isotropic or orthotropic solids
- Contact heat resistance
- Convection
- Radiation
- Surface-to-Surface (S2S) and Participating Media



Wearable devices



Electromagnetics Capabilities

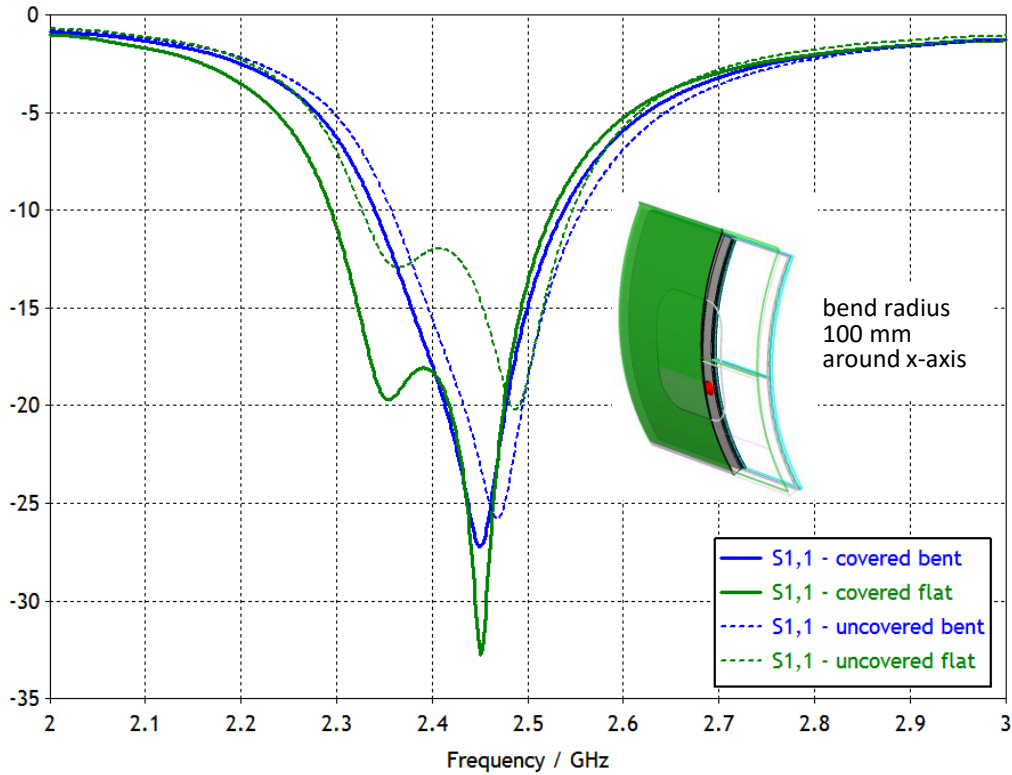
Communication (Smart Health)

Examples - IoT: Body Sensors, Wearable Antennas

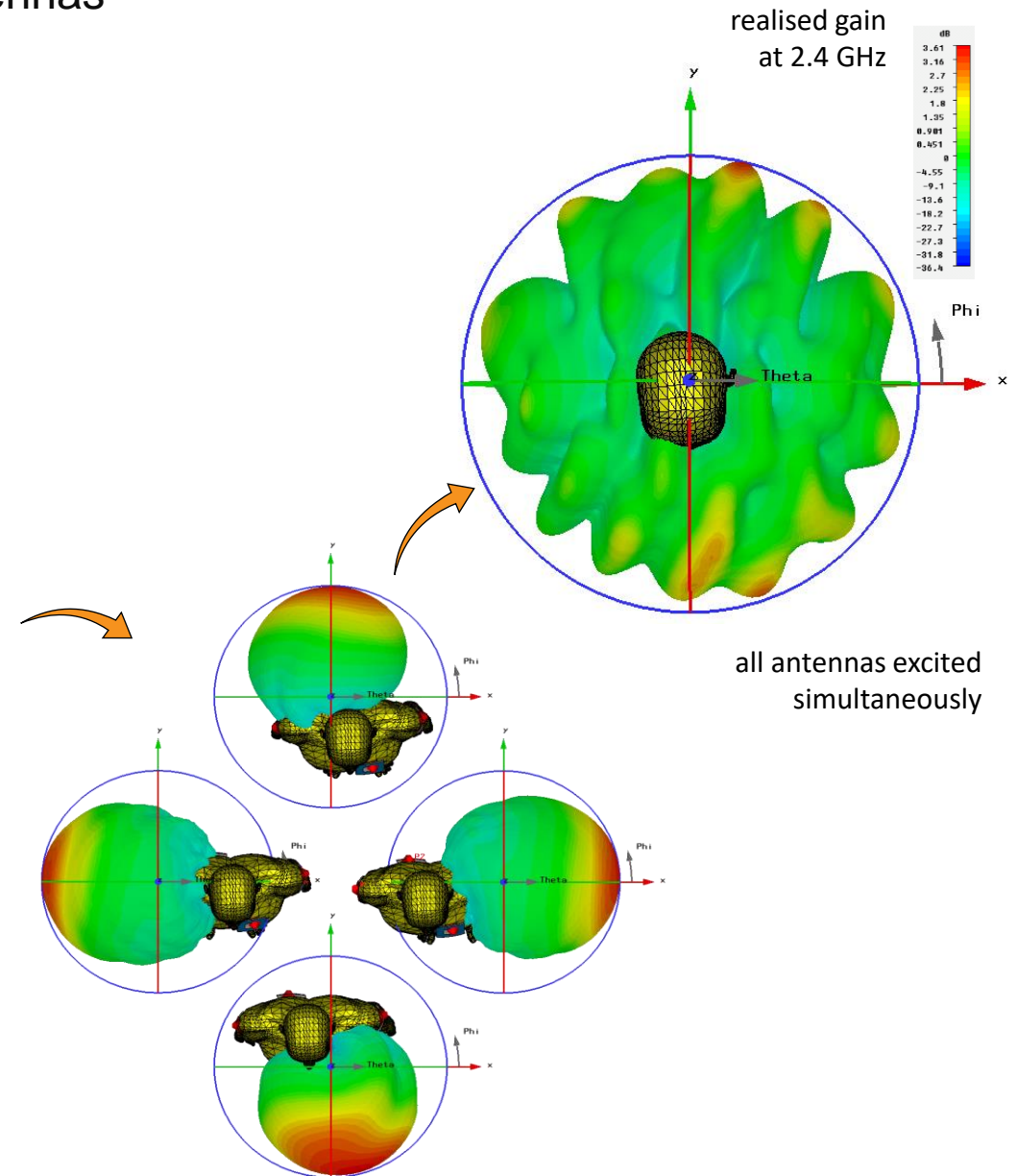
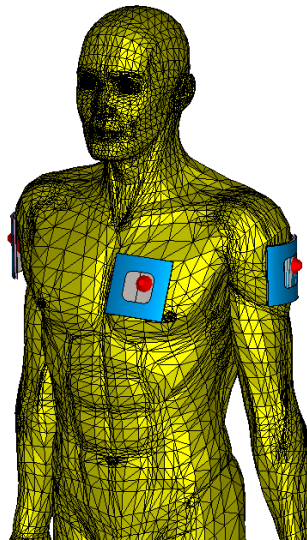
- Four antennas positioned around body

Antenna Performance

S-Parameter [Magnitude in dB]



flat vs. bent; covered vs. uncovered



Examples - IoT: Body Sensors, Wearable Antennas

Antenna in shoe Sole: Fabric based antenna



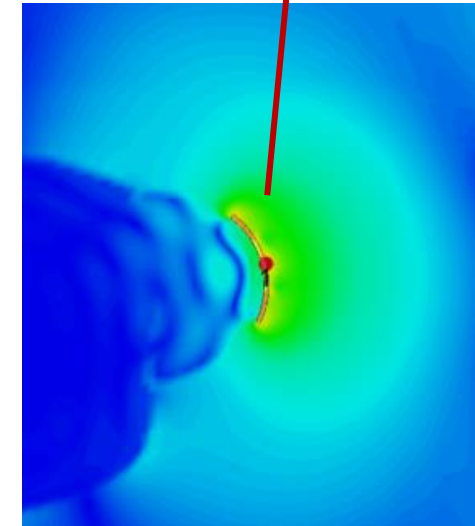
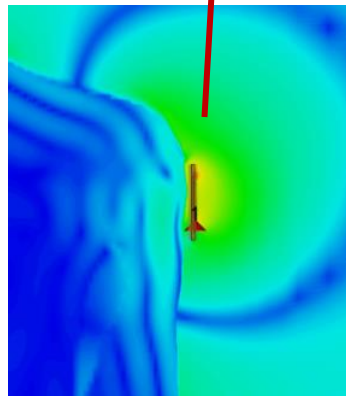
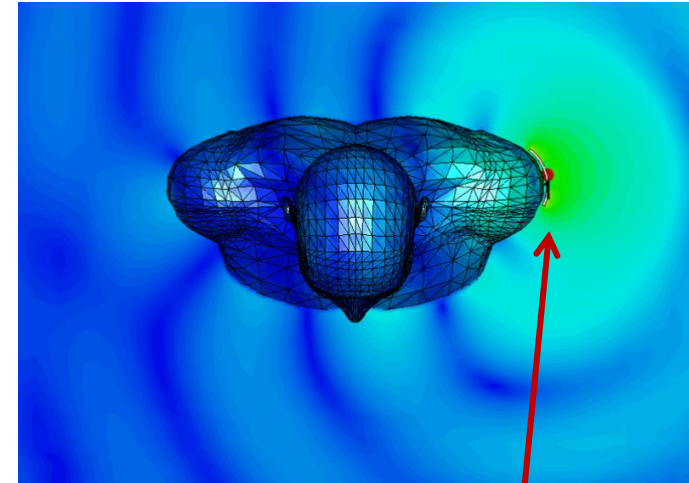
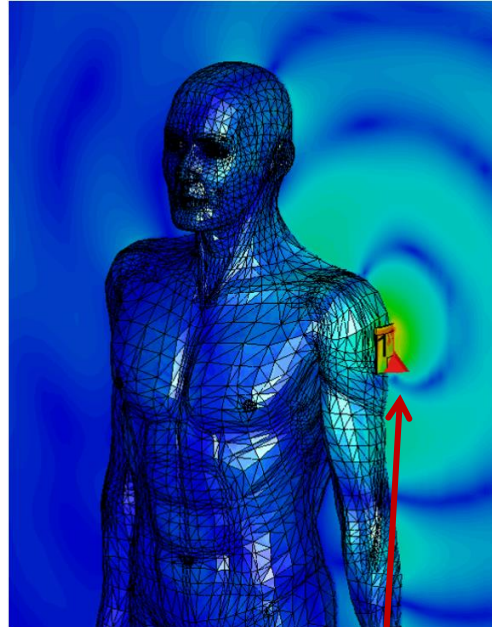
- The fabric antenna will be placed in shoe sole for connecting with phone!!

Communication (Smart Health)

Examples - IoT: Body Sensors, Wearable Antennas

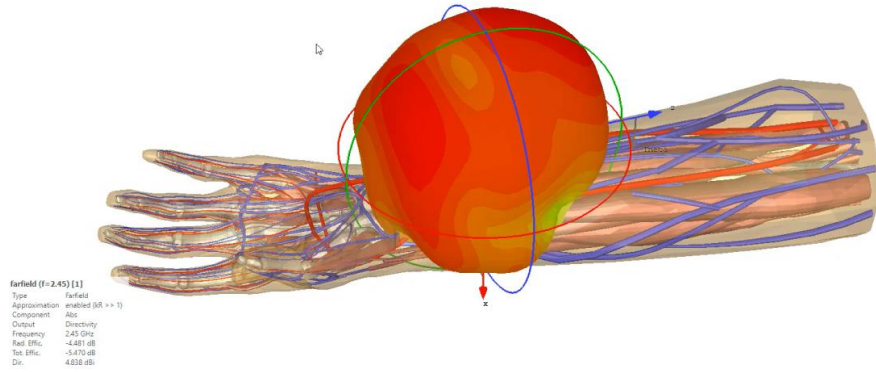
- Electromagnetic Field visualization inside the human body.
- Analysis of electromagnetic coupling and interferences between wearable devices.
- SAR evaluation and potential heating.
- Nearfield and farfield performance of antennas close to the human body.

GPS Antenna. Electric field distribution on the surface of the body surface as well as inside the body

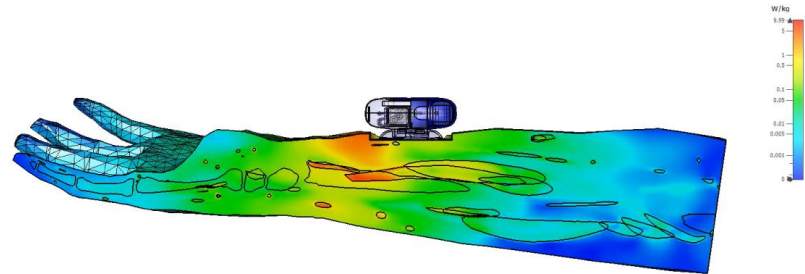
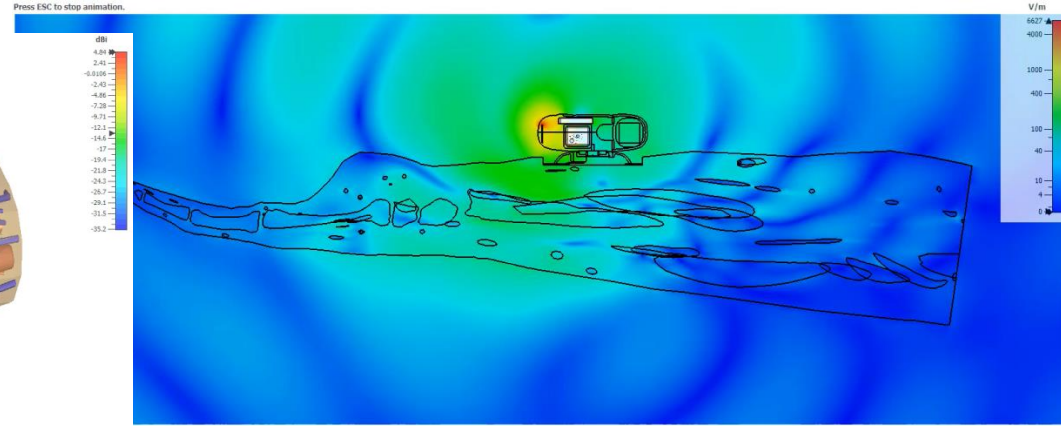


Examples - IoT: Body Sensors, Smart Watches

Antenna Farfield



Electric field distribution



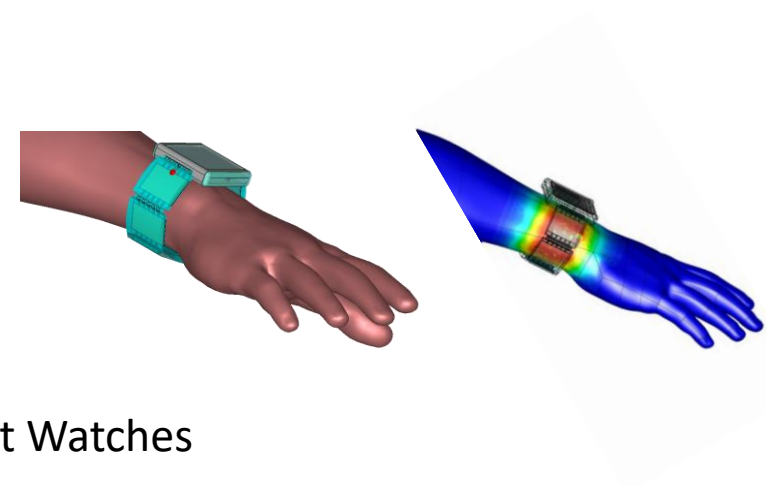
SAR (f=2.45) [1] (Point)

Frequency	2.45 GHz
Cross section	A
Cutplane at Y	64.500 mm
Maximum (Plane)	5.5904 W/kg
Minimum (Plane)	0 W/kg
Maximum	36.007 W/kg
Minimum	0 W/kg

Specific Absorption Rate (SAR)



Smart Watches





Thank You

