SCHEDULE OF LECTURES

FOR A COMPLETE LIST OF COAUTHORS SEE THE ABSTRACTS

Day 1: Sunday - 10 / 12 / 08

16:00 – 18:00 ***Registration***

18:00 – 19:00 ***Welcome Reception***

Evening

Sensing in Biology and Engineering: Outstanding Questions and Challenges

Session Chairs: **F.G. Barth and J.A.C. Humphrey**

19:00 – 19:50
●Keynote 1
M. Srinivasan, University of Queensland, Australia (p. 2)
"Sensible sensing in biology and engineering: Visual guidance of insect flight, and applications to robotics"

20:00 ***Dinner***

Day 2: Monday - 10 / 13 / 08

07:30 – 09:00 **Breakfast**

Morning

TRANSDUCTION PROCESSES IN BIOLOGICAL AND ENGINEERING SYSTEMS

Session Chair: **H. Bleckmann**

09:00 – 9:50
●Keynote 2
J. Kauer, Tufts University, USA (p. 6)
"Mimicking olfaction to capture the odor world"

09:50 – 10:25
S. Schütz, University of Göttingen, Germany (p. 7)
"Biomimetic fire recognition on the basis of insect olfactory systems"

10:25 – 10:55 ***Coffee Break***

10:55 – 11:30
H. Peremans, University of Antwerpen, Belgium (p. 8)
"Man made versus biological in-air sonar systems"

11:30 – 12:05
H. Schmitz and **H. Bousack,** University of Bonn, Germany (p. 9)
"Design of a fluidic infrared detector based on the photomechanic infrared sensilla in pyrophilous beetles of the genus Melanophila"

12:05 – 12:40
G. von der Emde, University of Bonn, Germany (p. 10)
"Remote electrical sensing: detection and analysis of objects by weakly electric fishes"

12:40 – 14:00 ***Lunch***

Afternoon

PROCESSING SENSORY INFORMATION

Session Chair: **J. Kauer**

14:00 – 14:50
●Keynote 3
H. Bleckmann, University of Bonn, Germany (p. 13)
"Nature as model for technical sensors"

14:50 – 15:25
G. Taylor, Oxford University, UK (p. 14)
"Sensory systems and flight stability: what do insect sensors measure, and why?"

15:25 – 15:55 ***Coffee Break***

15:55 – 16:30
R. Kurtz, Bielefeld University, Germany (p. 15)
"Adaptive encoding of motion information in the fly visual system"

16:30 – 17:05
B. Grothe, University of Munich, Germany (p. 16)
"Microsecond interaural time difference processing in the mammalian medial superior olive; the role of synaptic inhibition"

17:05 – 17:40
DeF. Mellon, University of Virginia, USA (p. 17)
"Sensory neuron synchrony in crayfish startle behavior: necessity, mechanism and development"

20:00 – 21:30 ***Dinner***

21:30 – 22:30 ***Social Hour***

Day 3: Tuesday - 10 / 14 / 08

07:30 – 09:00 ***Breakfast***

Morning

SENSES AND BEHAVIOR

Session Chair: **K. Arikawa**

09:00 – 09:50
●Keynote 4
F.G. Barth, University of Wien, Austria (p. 20)
"Small brains - clever periphery"

09:50 – 10:25
P. Narins, University of California at Los Angeles, USA (p. 21)
"Middle ear adaptations for seismic detection in the golden mole"

10:25 – 10:55 ***Coffee Break***

10:55 – 11:30
M. Ozaki, Kobe University, Japan (p. 22)
"CHC sensillum for nestmate recognition in ants"

11:30 – 12:05
F.-O. Lehmann, University of Ulm, Germany (p. 23)
"The visuo-motor system of fruit flies"

12:05 – 12:40
K. Arikawa, The Graduate University for Advanced Studies, Sokendai, Japan (p. 24)
"*Retinal organization and color vision in a butterfly, Papilio xuthus*"

12:40 – 14:00 ***Lunch***

Afternoon

BIOINSPIRED SENSORS

Session Chair: **M. Srinivasan**

14:00 – 14:50
●Keynote 5
G. Krijnen, University of Twente, The Netherlands (p. 26)
"Imitating cricket mechanosensory hairs: dream or reality?"

14:50 – 15:25
H. Krapp, Imperial College, UK (p. 28)
"Visual mechanisms of flight and gaze stabilization"

15:25 – 15:55 ***Coffee Break***

15:55 – 16:30
J. S. Humbert, University of Maryland, USA (p. 30)
"Control theoretic interpretations of tangential cell sensitivity patterns"

16:30 – 17:05
T. Daniel, University of Washington, USA (p. 31)
"Three-dimensional mechanics and dynamics of insect gyroscopes"

17:05 – 17:40
H. Malm, Lund University, Sweden (p. 33)
"Biologically inspired enhancement of dim light video"

17:40 – 18:15
D. Robert, University of Bristol, UK (p. 35)
"Insect auditory sensors: adaptive and active mechanisms"

20:00 – 21:30 ***Dinner***

21:30 – 22:30 ***Social Hour***

Day 4: Wednesday – 10 / 15 / 08

07:30 – 09:00 ***Breakfast***

Morning

SENSOR MATERIALS

Session Chair: **V. Tsukruk**

09:00 – 09:50
●Keynote 6
W. Knoll, MPI, Mainz, Germany (p. 38)
"Tethered bimolecular lipid membrane as a novel biosensor platform"

09:50 – 10:25
G. Sukhorukov, University of London, UK (p. 39)
"Tailoring functions: microcapsules as delivery and intracellular sensing systems"

10:25 – 10:55 ***Coffee Break***

10:55 – 11:30
V. Tsukruk, Georgia Tech, USA (p. 41)
"Assembling polymeric materials for responsive structures"

11:30 – 12:05
M. Utz, University of Virginia, USA (p. 42)
"Polyelectrolyte hydrogels as electromechanical transducer materials"

12:05 – 12:40
N. Kotov, University of Michigan, USA (p. 43)
"From nanoparticle to proteins and to nanoscale biosensing devices"

12:40 – 14:00 ***Lunch***

Afternoon

SENSOR FABRICATION

Session Chair: **G. Krijnen**

14:00 – 14:50
●Keynote 7
D. W. Hong, Virginia Tech., USA (p. 45)
" Roll, crawl, walk, climb, and jump: robot locomotion inspired by nature and beyond"

14:50 – 15:25

K. Grosh, University of Michigan, USA (p. 46)
"Modeling and mimicking the biological cochlea"

15:25 – 15:55 ***Coffee Break***

15:55 – 16:30

S. Große, Aachen University, Germany (p. 47)
"Flexible micro-pillars for wall-shear stress measurements"

16:30 – 17:05

N. André, Université catholique de Louvain, Belgium (p. 50)
"Artificial microbeams to sense air flow, temperature or humidity combining MEMS and CMOS technologies"

17:05 – 18:15

- **Oral Presentation of Posters (5 min/poster) –** The posters themselves will be on display Wednesday and Thursday

W. Augustin, Technische Universität Braunschweig, Germany (p. 65) – *"Coating of sensors in food and bio processing for the mitigation of fouling"*

B. Cummins, Montana State University, USA (p. 67) – *"Unsteady Stokes model for fluid-structure interaction: response of filiform hairs to a calling song of a cricket"*

W. C. Eberhardt, University of Virginia, USA (p. 72)– *"Sensing external hydrodynamic flow disturbances through a boundary layer using a biologically inspired neuromast-like fish sensor"*

H. R. Gwon, Chung-Ang University, Korea (p. 75) – *"A numerical approach to surface plasmon resonance sensor design with high sensitivity using single and bimetallic film structures"*

N. Izadi, University of Twente, the Netherlands (p. 76) - *"Design and fabrication process for artificial lateral line flow sensors"*

R. K. Jaganatharaja, University of Twente, the Netherlands (p. 79) - *"Optimization of bio-inspired hair sensor arrays"*

M. Kawasaki, University of Virginia, USA (p. 82) – *"An Information theoretical approach to parallel sensory pathways in weakly electric fishes"*

K. M. Khanafer, University of Michigan, USA (p. 83) – *"Fluid-structure interaction analysis of flow characteristics around a microcantilever in a fluidic cell"*

G. Gerling, University of Virginia, USA (p. 85) – *"Sensor position in a substrate impacts spatial and temporal response"*

G. C. Lewin, University of Southern Denmark, Denmark (p. 86) – *"A computational simulation of cercal hair interaction"*

Yi Liu, University of Southern Denmark, Denmark (p. 91) – *"Estimating global wind direction with fluid-coupled cercal hairs"*

T. Moriyama, Shinshu University, Japan (p. 92) – *"Estimation of cliff depth with reference to length of antennae in pill bugs (Armadillidium vulgare, Isopoda, Crustacea)"*

C. F. Schaber, University of Vienna, Austria (p. 95) – *"Micromechanics of spider mechanoreceptors"*

20:00 – 21:00 ***Reception***

21:00 ***Conference Banquet***

Day 5: Thursday - 10 / 16 / 08

07:30 – 09:00 **Breakfast**

Morning

SENSOR APPLICATIONS

Session Chair: **D. Hong**

09:00 – 09:50

●Keynote 8

J. Humphrey, University of Virginia, USA (p. 52)

"Modeling the physics of complex sensory systems: challenges and opportunities"

09:50 – 10:25

T. Delbrück, UZH-ETH Zürich, Switzerland (p. 53)

"Spike-based digital vision"

10:25 – 10:55 ***Coffee Break***

10:55 – 11:30

M. J. Z. Hartmann, Northwestern University, USA (p. 54)

"Computing sensory expectation on a whiskered robot"

11:30 – 12:05

G. Gerling, University of Virginia, USA (p. 58)

"A skin-receptor model to predict SA-I mechanoreceptor spike times"

12:05 – 12:40

L. Movileanu, Syracuse University, USA (p. 63)

"Channel-based stochastic sensing of proteins"

12:40 – 12:55 CONFERENCE CLOSURE

12:55 – 14:00 ***Lunch***