BSN 2016 – AGENDA

WORKSHOPS AND TUTORIALS
Tuesday, 14 June

0800-0900 Registration and Continental Breakfast – Conference Room Foyer, 2nd floor

0900-1200 Morning Sessions

Hack-a-thon (0900+ continues all day) – Conference Rooms 1&4, 2nd floor
Benny Lo/Imperial College and Intel

Ice House Challenge set up (by invitation only; three final teams) - Fisher Banquet Room, 1st floor
Note: contestants begin at 0800 h, Wednesday 15 June
U.S. Special Operations Command, U.S. Coast Guard and MIT Lincoln Laboratory
Amna Greaves (MIT LL), chair

1200-1330 Lunch (provided onsite) – Conference Room Foyer, 2nd floor

1300-1700 Afternoon Session – Conference Room 3, 2nd floor

4th Annual Workshop on Automated Sensor Based Mobility Analysis for Disease Prevention and Treatment - Bjoern Eskofier and Jochen Klucken (FAU/Erlangen)
TECHNICAL PROGRAM
Wednesday, 15 June

0730-0830  Registration and Continental Breakfast – Robertson Auditorium Foyer, 2nd floor
ALL POSTER BOARDS AND EXHIBITOR TABLES ARE TO BE SETUP BY THIS TIME

0830-0845 – Robertson Auditorium I, 2nd floor
Welcome (Technical Chair, Mark Buller)

0845-0930 (Introduction: Karl Friedl)
Keynote Speaker: Bjoern Eskofier, Ph.D, Digital Sports Group of the Pattern Recognition Lab, Friedrich-Alexander University, Erlangen, Germany
Smart shoes reach the clinic: wearable sensor-based instrumented gait analysis in Parkinson’s Disease

0930-1030 (Session Chair: Karl Friedl)
Session 1. NOVEL SENSOR APPLICATIONS

| 1 | Sensor systems for monitoring fluid intake indirectly and directly | JF Kreutzer, J Deist, CM Hein, TC Leuth |
| 2 | Diet eyeglasses: Recognising food chewing using EMG and smart eyeglasses | R Zhang, S Bernhart, O Amft |
| 3 | Gait Tracker Shoe for Accurate Step-by-step Determination of Gait Parameters | Y Zhuang, J Gong, DC Kerrigan, BC Bennett, J Lach |

1030-1100 AM COFFEE BREAK – Robertson Auditorium Foyer, 2nd floor
POSTERS – Robertson Auditorium 2 & 3, 2nd floor
(Presenters are asked to stand by their posters at this time)

1100-1145 (Session Chair: TBD)
Session 2. NON-HUMAN BIOMONITORING AND PROTECTION

| 1 | Using Collar-worn Sensors to Forecast Thermal Strain in Military Working Dogs | JR Williamson, AR Hess, CJ Smalt, DM Sherrill, TF Quatieri, C O’Brien |
| 3 | Towards a wearable system for continuous monitoring of sniffing and panting in dogs | R Brugarolas, T Agyayazi, S Yuschk, DL Roberts, BL Sherman, A Bozkurt |

1145-1230 (Introduction: Mark Buller)
Keynote Speaker: Doug Barton, MBA
IBM Analytics for Performance Management, Madison, Wisconsin
What can we learn from the toughest endurance bike race on earth?
### 1330-1500 (Session co-chairs: Mark Buller and Hilde Teien)

**Session 3. WEARABLE SENSOR APPLICATIONS IN EXTREME ENVIRONMENTS**

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<thead>
<tr>
<th></th>
<th>Title</th>
<th>Authors</th>
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<tbody>
<tr>
<td>1</td>
<td>Physiological monitoring in cold weather operations</td>
<td>H Teien</td>
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<td>2</td>
<td>Tracking body core temperature in military thermal environments: an extended Kalman filter approach</td>
<td>K-Y Seng, Y Chen, KMA Chai, T Wang, DCY Fun, YS Teo, PMS Tan, WH Ang, JKW Lee</td>
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<td>3</td>
<td>On single sensor-based inertial navigation</td>
<td>N Strozzi, F Parisi, G Ferrari</td>
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<td>4</td>
<td>Inclined walking energetics: body mass, loaded mass, and predictability</td>
<td>LW Ludlow, PG Weyand</td>
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<td>5</td>
<td>Monitoring thermal strain during recruit training</td>
<td>T Wyss, B Veenstra, S Delves, M Buller</td>
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### 1500-1530 PM COFFEE BREAK – Robertson Auditorium Foyer, 2nd floor

**POSTERS – Robertson Auditorium 2 & 3, 2nd floor**

(Presenters are asked to stand by their posters at this time)

### 1530-1615 (Introduction: John Hixson)

**Keynote Speaker: Rosalind Picard, Sc.D**

Affective Computing Research Group, MIT Media Lab, Cambridge, Massachusetts

*Connecting emotions, brain and behavior with wearables*

### 1615-1800 (Session Chair: John Hixson)

**Session 4. BODY SENSOR-BASED MONITORING IN CHRONIC DISEASE APPLICATIONS**

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<tr>
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<tbody>
<tr>
<td>1</td>
<td>An integrated wearable robot for tremor suppression with context aware sensing</td>
<td>D Huen, J Liu, B Lo</td>
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<tr>
<td>2</td>
<td>Active Implantable Sensor Powered by Ultrasounds With Application in Monitoring of Physiological Parameters for Soft Tissues</td>
<td>BM Gil-Rosa, GZ Yang</td>
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<td>3</td>
<td>On the use of wearable sensors to enhance motion intention detection for a contra laterally controlled FES system</td>
<td>AF Ruiz-Olaya</td>
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<td>4</td>
<td>Instantaneous P- and T-wave detection: assessment of three ECG fiducial points detection algorithms</td>
<td>H Leutheuser, S Gradl, L Anneken, M Arnold, N Lang, S Achenback, BM Eskofier</td>
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<td>5</td>
<td>Accurate gait analysis in post-stroke patients using a single inertial measurement unit</td>
<td>F Parisi, G Ferrari, A Baricich, M D'Innocenzo, C Cisari, A Mauro</td>
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1800-2000 SYMPOSIUM NETWORKING RECEPTION – Fisher Atrium, 1st floor

End of Day 1, Technical Program
TECHNICAL PROGRAM (continued)
Thursday, 16 June

0730-0830 Registration and Continental Breakfast – Robertson Auditorium Foyer, 2nd floor

0830-0900 (Introduction: Peter Weyand) – Robertson Auditorium I, 2nd floor
Keynote Speaker: Jim Glasheen, Ph.D
Technology Partners, Mill Valley, California
Wearables: the bridge between the consumer and healthcare industries?

0900-1000 (Session Chair: Peter Weyand)
Session 5. INDUSTRY APPLICATIONS PANEL
Applications of commercially available wearable systems will be highlighted in presentations by three industry developers
Panel Presenters:
- Anmol Sood (Equivital)
- Roozbeh Ghaffari (MC10)
- Kurt Pfluger (VivaLnk)

1000-1030 AM COFFEE BREAK – Robertson Auditorium Foyer, 2nd floor
POSTERS – Robertson Auditorium 2 & 3, 2nd floor
(Presenters are asked to stand by their posters at this time)

1030-1115 (Introduction: Eric Yeatman)
Keynote Speaker: Veena Misra, Ph.D
NSF Center for Advanced Self-Powered Systems of Integrated Sensors and Technologies (ASSIST), North Carolina State University, Raleigh, North Carolina
Body-powered sensors: the next generation of wearables

1115-1200 (Session Chair: Eric Yeatman)
Session 6. DATA QUALITY ISSUES FOR WEARABLES

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<td>1</td>
<td>An energy-efficient and QoS-effective resource allocation scheme in WBANs</td>
<td>Z Liu, B Liu, C Chen, CW Chen</td>
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<td>2</td>
<td>Accurate personal ultraviolet dose estimation with multiple wearable sensors</td>
<td>J Li, Y Liu, H Li, R Hua, CJ Xue, HG Lee, H Yang</td>
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<td>3</td>
<td>Wearable alcohol monitoring device with auto-calibration ability for high chemical specificity</td>
<td>Y Umasankar, AH Jalal, PJ Gonzalez, M Chowdhury, A Alfonso, S Bhansali</td>
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1200-1300 LUNCH (provided onsite) – Robertson Auditorium Foyer, 2nd floor
1300-1415 (Introduction: Kong Chen) – *Robertson Auditorium I, 2nd floor*
Keynote Speaker: David Klonoff, MD
Mills-Peninsula Health Services, Burlingame, California
_Wearable sensors as game changers in chronic disease management: achieving physiological homeostasis in diabetes_

1415-1530 (Session Chair and Introductory Presentation: Kong Chen)
**Session 7. WEARABLE BIOMECHANICS**

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<tr>
<th></th>
<th>Learning approach for classification of GENEActiv accelerometer data for unique activity identification</th>
<th>A Dutta, O Ma, MP Buman, DW Bliss</th>
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<tr>
<td>2</td>
<td>A double-layer automatic orientation correction method for human activity recognition</td>
<td>X Wu, X Xu, W Kaiser, G Pottie</td>
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<tr>
<td>3</td>
<td>Impact forces during running: loaded questions, sensible outcomes</td>
<td>AB Udofa, LJ Ryan, PG Weyand</td>
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<td>4</td>
<td>A novel flexible wearable sensor for estimating joint-angles</td>
<td>SI Lee, J-F Daneault, L Weydert, P Bonato</td>
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1530-1600 PM COFFEE BREAK – *Robertson Auditorium Foyer, 2nd floor*
POSTERS – *Robertson Auditorium 2 & 3, 2nd floor*
(Presenters are asked to stand by their posters at this time)

1600-1715 (Session Chair: TBD)
**Session 8. NOVEL NETWORKING AND PLATFORM SOLUTIONS**

|   | HACMAC: A reliable Human ACtivity-based Medium Access Control for implantable body sensor networks      | VRK Ramachandran, PJM Havinga, N Meratnia |
| 2 | Towards a comprehensive power consumption model for wireless sensor nodes                              | M Hesse, M Adams, T Hormann, U Ruckert |
| 3 | Towards an open data framework for body sensor networks supporting bluetooth low energy               | NK Singh, DO Ricke                |
| 4 | Profiling, modeling, and predicting energy harvesting for self-powered body sensor platforms           | D Fan, LL Ruiz, J Gong, J Lach    |

1715-1800 RESULTS OF COMPETITIONS & AWARDS (Hack-a-thon, Ice House Challenge, Best papers)

End of Day 2/End of Technical Program
Friday, 17 June

WORKSHOPS AND TUTORIALS

0800-0900 Continental Breakfast – *Robertson Auditorium Foyer, 2nd floor*

0900-1200 Morning Sessions – *Conference Rooms, 2nd floor*

1. Workshop: Integrating Body Sensing Modalities with Augmented Reality & Virtual Reality Environments, MIT Lincoln Laboratory  
   *Conference Room 3*

2. Workshop: BSN Student Colloquium  
   Presentations of BSN student posters and award session  
   *Conference Room 1*

3. Tutorial: "Patch Development for capturing body derived data: features explored, lessons learned and optimizing the balance between the technical performance and wear comfort,"  
   Holst Centre (Frank Everaerts)  
   *Conference Room 2*

4. Tutorial: "Energy-efficient design methodologies for wireless body area sensor network in healthcare applications," University of Cincinnati/University of West Florida (Suryadip Chakraborty)  
   *Conference Room 4*

1200 End of conference