The International Society for the Measurement of Physical Behaviour (ISMPB) and the National Institutes of Health (NIH) present

The 5th International Conference on Ambulatory Monitoring of Physical Activity and Movement (ICAMPAM)

June 21-23, 2017 | National Institutes of Health (NIH) | Bethesda, Maryland

Detailed Program

Tuesday, June 20, 2017

Pre-Conference Workshops

9:00 a.m. – 10:45 a.m.  **Room G1:** Compositional Data Analysis – Hands on Demonstration - Sebastian Chastin and Dr. Elisabeth Winkler

**Gait Lab:** Gait Lab Tour and Demo - Diane Damiano and Christopher Stanley

10:45 a.m. – 11:00 a.m.  Break

11:00 a.m. – 12:45 p.m.  **Auditorium A:** Functional Data Analysis for Wearables: Methods and Applications

Vadim Zipunnikov, Jeff Goldsmith and Ciprian Crainiceanu

**Auditorium B:** Sensor Methods Collaboratory

Richard Troiano

**Room G1:** Enhancing the Ambulatory Assessment Tool Box

Ulrich Ebner-Priemer and Hans Bussman

**Room G2:** Grasping Physical Activity: Using 3D Printers to Visualize Physical Activity

Melitta McNarry and Kelly Mackintosh

12:45 p.m. – 1:45 p.m.  Lunch Break

1:45 p.m. – 3:30 p.m.  **Auditorium A:** Data Privacy - From Ethics to Compliance and Trust

Joss Langford, Mark Lizar and Tom Torkar

**Auditorium B:** AlphaBET: Consensus meeting on the development of a taxonomy of 24 hour activity cycle data (PART 1)

Jorunn Helbostad, Sebastien Chastin, Malcolm Granat, Richard Troiano and Mark Tremblay

**Room G2:** Objective measures of free-living physical behavior. What can they tell us about physical capacity in persons with mobility limiting conditions?

Douglas Maxwell, Andy Kerr, Nicholas Smith and David Loudon

3:30 p.m. – 3:45 p.m.  Break
3:45 p.m. – 5:30 p.m. **Auditorium A:** Novel Analytics, Signal Processing and Exercise Science  
*Gareth Stratton, Huw Summers, Rowan Brown and Michael Rosenberg*

**Auditorium B:** AlphaBET: Consensus meeting on the development of a taxonomy of 24 hour activity cycle data (PART 2)  
*Jorunn Helbostad, Sebastien Chastin, Malcolm Granat, Richard Troiano and Mark Tremblay*

**Room G1:** Pooling of Daily Activity Data Across Borders and Culture  
*Tamara Harris, Eric Shiroma, Charles Matthews, Annemarie Koster and Sari Stenholm*

5:30 p.m. – 6:00 p.m. **Break**

6:00 p.m. – 8:00 p.m. **Welcome Reception at Hyatt Bethesda**

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**Wednesday, June 21, 2017**

8:30 a.m. - 9:00 a.m. **Welcome**

9:00 a.m. – 10:00 a.m. **Keynote Presentation**

  *Bjorn Eskofier*, Friedrich-Alexander Univeristat Erlangen- Nürnberg, Germany

  *Smart Shoes Reach the Clinic: Wearable Sensor-Based instrumented Gait Analysis for Movement Disorders*

10:00 a.m. - 11:00 a.m. **Speakers and Abstracts**

**Kirschstein Auditorium: Incorporating Place-Based Data**

  *Diane Cook (Invited Speaker): Activity-Aware Smart Homes for Health Assessment and Intervention*

  *Danny Rafferty: Combining GPS and Activity Monitoring to Understand the Context, Location, Volume and Intensity of Physical Activity*

  *Harm op den Akkar: Home Based Measuring of Physical Activity and Sleep in the eWALL Platform*

**Auditorium A: Analytic Approaches for 24 Hour Data**

  *John Staudenmayer (Invited Speaker): Analytic Approaches to Sensor Collected Measurements*

  *Sebastien Chastin: Compositional Analysis for 24 Hour Activity Data: Potential and Limitations*

  *Vadim Zippunikov: Multilevel Functional Methods for Modeling Actigraphy Data and its Application to Predicting Mortality in the US Population*

  *Matthew Buman: The Isotemporal Substitution Paradigm: Opportunities and Limitations for Estimating 'Replacement' Effects in 24 Hour Sensor Data*

**Auditorium B: Physical Activity and Associated Outcomes**

  *Markus Reichert: Combining Accelerometry and Magnetic Resonance Imaging Data; Associations between Non-Exercise Activity and Brain Grey Matter Volume*
Annemarie Koster: Sedentary Time and High Intensity Physical Activity Versus Cardio-Respiratory Fitness: What is More Important for Cardio-Metabolic Health for Adults Aged 40-75?

Paulina Husu: At Least 10-Minute Bouts and Breaks in Sedentary Behavior are Associated with Diabetes/Elevated Blood Glucose.

Kristy Bell: Physical Activity and Sedentary Behaviour in Patients with Inflammatory Joint Disease: A Cross Sectional Study

**Auditorium C: Taking a ‘Step’ Forward**

Ben Stansfield: The Detection of Purposeful Stepping Using a Wrist Worn Accelerometer

Nicholas Smith: Slow but Sure: The Accurate Measurement of Slow Stepping


Alexandra Clark-Cornwell: The Distribution of ActivPAL Postural and Stepping Classifications within ActiGraph Activity Classifications

11:00 a.m. – 11:15 a.m. Break

11:15 a.m. – 12:15 p.m. Speakers and Abstracts

**Kirschstein Auditorium: Clinical Applications of Monitoring Devices**

Matthew Smuck (Invited Speaker): Physical Performance Monitoring and Clinical Applications in Orthopedics

Wilshaw Stevens Jr: Objective Ambulatory Activity Better Describes the Function of Patients with Hip Deformities

Bernd Grimm: Objective Diagnosis and Outcome Assessment of Shoulder Pathologies is Clinically Feasible Using Inertial Activity Monitors to Derive Asymmetry of Intense Upper Arm Movements

**Auditorium A: Accelerometer Wear-Time and Activity Analysis**

Eric Shiroma: Comparing Methods for Creating an Overall Physical Activity Estimate from Multiple Accelerometer Days

Daniel Arvidsson: More High Intensity Physical Activity in the Population with New Method to Process ActiGraph Accelerometer Data

Nicolas Aguilar-Farias: How many Days are Enough for Measuring Physical Behavior with the ActivPAL in Working Adults?

Anna Pulakka: Utility of ActiGraph wear sensor in Assessing Wear-Time in 24-Hour Wrist Measurement

**Auditorium B: Multimodal Assessment**

Miriam Cabrita: The Context of Physical Activity of Older Adults in Daily Life: Combining Accelerometry and Ecological Momentary Assessment
Eleftheria Giannouli: Associations of Real-Life Mobility with Measures of Physical, Cognitive, as well as Psychosocial Functioning in Community-Dwelling Older Adults

Pierre-Yves de Mullenheim: Estimating Energy Expenditure During Outdoor Level Walking Using Global Positioning System or Accelerometry in Patients with Peripheral Artery Disease

Bronwyn Clark: Using Bluetooth Proximity Sending to Determine Location in a Workplace

Auditorium C: Sleep Classification

Tiago Barreira: Accuracy of an Automated Algorithm to Detect Nocturnal Sleep in Adults using 24-Hour Waist Accelerometry

Daniel Heil: Accurate Measurement of Sleep Outcome Variables Using Wrist-Worn Monitors May Require User Input

Peter Eastwood: Automated Sleep Scoring Algorithms for Activity Monitors - A Comparison to Polysomnography in the Raine Study

Michelle Trevenen: Sleep Pattern Detection Using Raw Tri-Axial Wrist and Hip Actigraphy in the Raine Study

12:15 p.m. – 1:00 p.m. Lunch and Poster Session 1

1:00 p.m. – 1:45 p.m. Lunch and Poster Session 2

1:45 p.m. - 2:45 p.m. Symposia

Kirschstein Auditorium

Jacek Urbanek: Statistical Modelling of Circadian Rhythms of Physical Activity

Auditorium A

Joanne McVeigh: The Clinical Utility of Accelerometers in Clinical Populations

2:45 p.m. – 3:45 p.m. Speakers and Abstracts

Kirschstein Auditorium: Utility of Consumer Devices

Kate Lyden (Invited Speaker): Measuring Physical Behavior: Insights from Device Manufacturers and Academic Research Laboratories

Yang Bai: Which Heart Rate-Based Monitor is Better: Apple Watch or Fitbit Charge HR?

Lindsay Toth: Criterion Validity of Consumer and Research Grade Activity Monitors During Brief, Intermittent Walking
Auditorium A: Physical Activity Measurement in Youth

Russel Pate: *EASY – An Instrument for Surveillance of Physical Activity in Youth*

Beth Smith: *Full Day Arm Movement Patterns Across Early Infancy*

Rachel Colley: *All days, most days, or an average: Operationalizing the Current Physical Activity Recommendation for Children and Youth*

Auditorium B: Ambulation in Older Adults

Christopher Buckley: *How much Does Healthy Gait Change when Moving away from a Laboratory?*

Martina Mancini: *Turning at Home and During Community Ambulation in Parkinson’s Disease: A New Measure for Fall Risk?*

Amal Wanigatunga: *Investigating the Intervening Effect of Hospitalizations on Physical Activity Patterns Measured by Accelerometry*

Jeffrey Hausdorff: *Alterations in Community Stepping and Step Quality Among Older Adults with Mild Cognitive Impairment*

Auditorium C: Physical Activity in Cardiovascular Disease Populations

Wouter Harmsen: *Unfavorable Physical Behaviour in Persons with Aneurysmal Subarachnoid Hemorrhage: In-Depth Objective Measures of Physical Activity and Sedentary Behaviour*

Danny Rafferty: *Exploring Free Living Physical Activity Profiles: Beyond Step Count*

Chris Pickford: *Quantifying the sit-to-stand and stand-to-sit Transition from Free-living Data*

Arshi Iqbal: *Identification and Measurement of Ambulatory Activity after Stroke using Real Time Location Technology*

3:45 p.m. - 4:00 p.m.  **Break**

4:00 p.m. – 5:00 p.m.  **Keynote Presentation**

Jennifer Hicks, Stanford University, CA, USA

*Planetary Scale Smartphone Data Reveal Relationships Between Physical Activity, Environment, & Health*

5:00 p.m. – 6:00 p.m.  **ISMPB General Membership Meeting**
Thursday, June 22, 2017

8:30 a.m. – 10:00 a.m. **Keynote Presentations: Devices in Very Large Cohorts**

- **Nick Wareham**, Medical Research Council, University of Cambridge, UK
  - *Measuring physical activity objectively in the UK Biobank study*

- **Heiner Boeing**, German Institute of Human Nutrition, Berlin, Germany
  - *7-day accelerometry in the German Health Study (National Cohort)*

- **James McClain**, National Institute of Health, USA
  - *Participant Technology and Assessment in the All of Us Research Program: Current Status and Future Innovations*

10:00 a.m. – 10:15 a.m. **Break**

10:15 a.m. – 11:15 a.m. **Speakers and Abstracts**

**Kirschstein Auditorium: Analytic Approaches and Metrics**

- **Tommi Vasankari** *(Invited Speaker)*: *Use of Mean Amplitude Deviation as an Approach to Acceleration Data Processing – Experience from Finnish Population Based Studies*

- **Paul Jarle Mork**: *Objective Measurement of Physical Activity in the Norwegian HUNT Study*

- **Arturo Vega-Gonzales**: *Clustering Algorithms for Recognition of ADL Performed with Upper Limbs*

**Auditorium A: Consumer Device Applications in Research**

- **Keith Diaz**: *Does Stress Influence the Volume and Pattern of Sedentary Behavior? Group and Person (N of 1) Level Results of 1-Year Observational Study among Health Adults*

- **Charlotte Edwardson**: *Accuracy of Consumer Physical Activity Trackers for Measuring Step Counts: Comparison against a Validated Waist-worn Pedometer*

- **Nga Nguyen**: *Consumer Wearable Activity Trackers as Behavioural Interventions and Continuous Monitoring of Physical Behaviors; Lessons from ACTIVATE trial*

**Auditorium B: From the Lab to Free-Living**

- **Hala Abdul-Rahman**: *From Bounded to Pragmatic Data Collection: Validity of State of the Art Activity Recognition in Daily Life Context*

- **Meynard John Toledo**: *Validity of a Statistical Estimation Framework for Energy Expenditure Estimation of Lab-based and Free-Living Physical Activities from a Wrist-Worn Accelerometer*

- **Chuen-Ru Liu**: *What plays the determinant role in persons with dementia and sleep disturbance: Outdoor walking, evening artificial light exposure, or sleep education: A meta-analysis*
Auditorium C: Approaches to Estimating Intensity in Accelerometry

Juned Siddique: Estimating Relative Intensity Physical Activity Accelerometer Cut-Points Using a Maximal Graded Exercise Treadmill Test

Elroy Aguiar: Classification Accuracy of Cadence Cut-Points for Discriminating Moderate and Vigorous Intensity Ambulation

Ruben Brondeel: Impact of Epoch Lengths on Accelerometer Activity Intensity Estimations for Adults

John Bellettiere: Parameterizing and Validating Existing Algorithms for Identifying Out-of-Bed Time using Hip-Worn Accelerometer Data from Older Adults

11:15 a.m. - 11:30 p.m. Break
11:30 p.m. - 12:30 p.m. Exhibitor Talks (Kirschstein Auditorium)
12:30 p.m. - 1:30 p.m. Lunch and Poster Session 3
1:30 p.m. - 2:30 p.m. Lunch and Poster Session 4
2:30 p.m. - 3:30 p.m. Special Presentation (Kirschstein Auditorium)

Deborah Estrin: Using Small Data to Personalize, Sustain and Study Health Behavior

3:30 p.m. - 4:30 p.m. Keynote Presentation

Karl E. Friedl, University of California, San Francisco, USA

Monitoring of Sleep and Other Neurophysiological Parameters Outside of the Laboratory Setting

4:30 p.m. - 4:45 p.m. Break
4:45 p.m. - 6:00 p.m. Special Symposium (Kirschstein Auditorium)

Friday, June 23, 2017

8:30 a.m. - 9:30 a.m. Keynote Presentation

Mike McConnell, Verily Life Sciences, CA, USA

Use of mobile/wearable devices for research and clinical care

9:30 a.m. - 11:00 a.m. Speakers and Abstracts and Symposia

Kirschstein Auditorium: Estimating Energy Expenditure with ActiGraph

Samuel LaMunion: Application of the ActiGraph GT9X IMU to estimate Energy Expenditure

Charles Matthews: ActiGraph Done Six Ways
Scott Crouter: Use of the ActiGraph GT9X IMU to Predict Energy Expenditure

Thomas White: Absolute Validity of Activity Energy Expenditure Estimates from Wrist Accelerometry

Jairo Migueles: Which is the Best Accelerometer-based Metric to Predict Free-living Activity Energy Expenditure?

Auditorium A: Activity Analysis in Special Populations

Alexander Montoye: Using Machine Learning and Accelerometry to Improve Energy Expenditure Prediction in Pregnant Women

Berit Steenbock: Calibration of the GENEActive wrist-and-hip Worn Accelerometer for Prediction of Activity-Related Energy Expenditure in Preschoolers

Norman Wirsik: Comparability of Different Accelerometers and Sites for Activity-Related Energy Expenditure Prediction in Preschool Children

Norman Wirsik: Using Expectile Regression and Hidden Markov Models to Assess Accelerometer Data

Junrui Di: Fragmentation of Physical Activity and Its Application

Bernd Grimm: Physical activity of frail elderly living at a care facility or at home: Is there a difference?

Auditorium B: Symposium

Tamara Harris: Application of Accelerometry to Identify Clinical Trajectories

Auditorium C: Symposium

Amy Lu: Technology Assisted Physical Activity Measurement Among Children: Attractions and Pitfalls

11:00 a.m. – 11:15 a.m.  Break

11:15 a.m. -12:15 p.m.  Speakers and Abstracts and Symposia

Kirschstein Auditorium: Approaches to Harmonizing and Standardizing Big Data

David Loudon: The Role of Interactive Visualization in the Interpretation of Big Behavior Data

Kathleen Merikangas: Motor Activity Research Consortium for Health (mMARCH): Standardization of Procedure and Analyses of Mobile Technologies in Mood Disorders and Related Conditions

Joss Langford: Interoperability of Data and Devices

Auditorium A: Physical Activity Behavior in Youth

Joanne McVeigh: Objectively Measured Physical Activity and Sedentary Time and Cardio-metabolic Biomarkers in Youth Adults: A Compositional Data Analysis

Rachel Colley: All days, most days, or an average: Operationalizing the Current Physical Activity Recommendation for Children and Youth
Ben Stansfield: Activity Pattern Differences Between Obese and Normal Weight Children

Auditorium B: Symposium

Genevieve Healy: Using Activity Monitors to Develop, Evaluate, and Refine Whole-Day Interventions

12:15 p.m. – 12:45 p.m. Closing Remarks