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

June 21-23, 2017 | National Institutes of Health (NIH) | Bethesda, Maryland
Natcher Conference Center (Building 45)

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 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**
Rick Troiano

Room G1: **Enhancing the Ambulatory Assessment Tool Box**
Ulrich Ebner-Priemer and Hans Bussmann

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 Compiance 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, Rick 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.   <u>Auditorium A:</u> **Novel Analytics, Signal Processing and Exercise Science**
Gareth Stratton, Huw Summers, Rowan Brown and Michael Rosenberg

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

<u>Room G1:</u> **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**

Wednesday, June 21, 2017

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

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

Bjoern 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**

<u>Kirschstein Auditorium: Incorporating Place-Based Data</u>

Session Chair: Sylvia Spengler *(National Science Foundation)*

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*

<u>Auditorium A: Analytic Approaches for 24 Hour Data</u>

Session Chair: Chuck Matthews *(National Institute of Health)*

Vadim Zipunnikov: *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*

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

John Staudenmayer (Invited Speaker): *Isotemporal Substitution Modeling versus Compositional Data Analysis*

Auditorium B: Physical Activity and Associated Outcomes

Session Chair: Catrine Tudor-Locke *(University of Massachusetts Amherst)*

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?*

Pauliina Husu: *At least 10-min Physical Activity 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

Session Chair: Jeffrey Hausdorff *(Tel Aviv Sourasky Medical Center)*

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

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

Emma Fortune: *Free-Living Dynamic Skeletal Loading Estimation Using Tri-Axial Accelerometers*

Alexandra Clarke-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

Session Chair: Alison Cernich *(National Institutes of Health)*

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

Session Chair: Ulrich Ebner-Priemer *(Karlsruhe Institute of Technology)*

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

Session Chair: Theresa Cruz *(National Institute of Health)*

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

Session Chair: Rebecca Spencer

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 - Symposia

     Jacek Urbanek: *Statistical Modelling of Circadian Rhythms of Physical Activity*

Auditorium A - Symposia

     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

     Session Chair: Genevieve Healy *(The University of Queensland, School of Public Health)*

     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

     Session Chair: Alan Donnelly *(University of Limerick)*

     Russell 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

     Session Chair: Jorunn Helbostad *(Norwegian University of Science and Technology)*

     Fabio Storm: *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

      Session Chair: Mary Evans *(National Institutes of Health)*

      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

Session Chair: Søren Brage *(University of Cambridge)*

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

Session Chair: David Bassett *(University of Tennessee, Knoxville)*

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

Session Chair: Patty Freedson *(University of Massachusetts, Amherst)*

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

Session Chair: Rick Troiano *(National Cancer Institute)*

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: *Paramaterizing 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

   Session Chair: Dana Wolff

   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

Session Chair: Hans Bussmann *(Erasmus MC University Medical Center)*

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 Difference 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

Session Chair: Malcolm Granat *(University of Salford)*

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

    Session Chair: Bronwyn Clark *(The University of Queensland)*

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

    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**