
Personal Data

Date of birth: 15 June 1975
Place of birth: Leipzig, Germany
Marital status: Married, 2 children
Citizenship: German (EU), perm. residency USA

Research Statement

My research agenda is centered on Ubiquitous Computing and Applied Machine Learning for Computational Behavior Analysis, that is, I am interested in building computational systems for understanding behavior through analyzing activities. Behavioral data is thereby captured in an opportunistic way and utilizing a variety of sensing modalities, most notably ubiquitous and wearable sensors (e.g., accelerometers, RFID, environmental sensors), cameras, or microphones. The main purpose of this technical agenda is to support and promote health and wellbeing, e.g., through developing innovative assistive technology that serves as an enabler for research that has a positive impact on people’s life. The key to these is fundamental research in ubiquitous and wearable computing, and specifically in innovative machine learning techniques with strong focus on their application related challenges.

I consider myself as an applied Computing Scientist with a methodological focus on Machine Learning. As such I aim for the development and real-world deployment of innovative data analysis techniques beyond artificial settings, which typically comes with an additional and very different set of challenges beyond core method development.

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Education

Bielefeld University, Bielefeld, Germany

(October 2001 – June 2005)

PhD Student, Computer Science (Pattern Recognition)

- Advisor: Dr Gernot A. Fink
- Thesis: “Advanced Stochastic Protein Sequence Analysis”
- Overall grade: very good

Bielefeld University, Bielefeld, Germany

(October 1998 – September 2001)

MSc Student, Computer Science / Robotics

- Advisor: Dr Gernot A. Fink
- Thesis: “Online Adaptation of Statistical Speech Recognition Systems” [in German]
- Overall grade: with distinction

University of Cooperative Education, Mosbach, Germany

(October 1995 – September 1998)

MEng Student, Technical Computer Science

- Thesis: “Calculation of the capacity of electric circuits with regard to ground planes in Printed Circuit Boards” [in German]
- Overall grade: 1.3 (scale 1–6, 1 being best)

11th High School, Leipzig, Germany

(September 1991 – September 1993)

- Abitur (University Entrance Qualification)
- Overall grade: 1.5 (scale 1–6, 1 being best)

Affiliations

School of Interactive Computing, Georgia Institute of Technology, Atlanta, GA, USA

(since February 2017)

Associate Professor of Computing

- Head of Computational Behavior Analysis (CBA) group – cba.gatech.edu
- Affiliated with Ubiquitous Computing group – ubicomp.cc.gatech.edu

School of Computing Science, Newcastle University, Newcastle upon Tyne, UK

(February 2012 – January 2017)

Reader “Computational Behaviour Analysis” (August 2016 – January 2017)

Senior Lecturer “Context Aware Computing” (February 2014 – July 2016)

Lecturer (tenured Assist. Prof.) “Context Aware Computing” (February 2012 – February 2014)

- Leading ubiquitous computing and applied machine learning activities
- Affiliated with Open Lab (formerly: Digital Interaction research group at Culture Lab)

School of Interactive Computing, Georgia Institute of Technology, Atlanta, Georgia, USA

(February 2011 – January 2012; affiliated since then)

DFG Research Fellow

- Project: “Discriminative Statistical Models for Multi-Modal Behavioral Assessment and Measurement in Social Interactions”
- Affiliated with NSF expedition in Computing “Computational Behavior Science”
- Active collaboration with: Profs. G. Abowd, J. Rehg, I. Essa

School of Computing Science, Newcastle University, Newcastle upon Tyne, UK
(November 2009 – January 2011)

Postdoctoral Research Associate “Machine Learning”

- Affiliated with RCUK Digital Economy research hub “SiDE – Social Inclusion through the Digital Economy” – Connected Home and Community theme
- Worked on ubiquitous computing applications of activity recognition and applied machine learning techniques

Intelligent Systems Group, TU Dortmund University, Dortmund, Germany
(May 2006 – October 2009)

Postdoctoral Senior Researcher

- Coordinated research activities on smart environments within FINCA lab
- Developed sequential data analysis techniques for pattern recognition applications

Applied Computing Science, Bielefeld University, Bielefeld, Germany
(October 2001 – April 2006)

Researcher

- Research in Statistical Pattern Recognition for real-world applications (speech recognition, handwriting recognition, computer visions, bioinformatics)
- Pursued PhD project

Teaching

Georgia Institute of Technology

- “Artificial Intelligence” – CS6001/CS6001-O (Graduate level)
 - Fall 2020 (592 students: 106 on campus, 486 online)
 - Summer 2020 (238 students online)
 - Fall 2019 (415 students: 128 on campus, 287 online)
- “Mobile and Ubiquitous Computing” – CS4605A/7470A (PhD, MSc, BSc)
 - Spring 2020 (96 students)
 - Spring 2019 (92 students)
 - Fall 2018 (75 students)
 - Spring 2018 (77 students)
 - Fall 2017 (87 students, I revamped course content)

Newcastle University

- Module Leader “Machine Learning” (MSc, MRes)
 - 2016/17, 2015/16, 2014/15 (new course)
- Module Leader “Technologies for Digital Civics [Ubiquitous Computing]” (MRes)
 - 2015/16, 2014/15 (new course)
- Module Co-Leader “Programming and Data-structures” (MSc)
 - 2013/14
- Module Leader “Research Methods” (MSc)
 - 2015/16, 2014/15, 2013/14, 2012/13

TU Dortmund University

- Module Leader “Pattern Recognition” (MSc)
 - 2006/07
- Group project: “NextWii: Multimodal Interaction with Computer Games” (MSc)

- 2009/10
- Group project “Active Localization & Tracking of Sound Sources Using Artificial Heads” (MSc)
 - 2007
- Group project: “Video-based Detection and Identification of Persons” (MSc)
 - 2006/2007
- Exercise classes for module: “Automatic Speech Recognition” (MSc)
 - 2006 – 2009

Bielefeld University

- Exercise classes for course: “Automatic Speech Recognition”
- Exercise classes for course: “Image Processing”
- Group project: “Autom. Detection of Song Changes in Music Mixes using Statistical Models”
- Group project: “Evaluation of Image Processing Features for Protein Sequence Analysis”
- Group project: “Development of a graphical HMM-viewer”
- Various seminar courses

Guest Teaching (for details see “Invited Talks and Seminars”)

- University of Virginia, Charlottesville, USA
- University of Texas, Austin, USA
- Federal University of Campinas, Campinas, Brazil
- Federal University of Manaus, Manaus, Brazil
- Bristol University, Bristol, UK
- Sheffield University, Sheffield, UK
- TU Darmstadt University, Darmstadt, Germany
- University of Münster, Münster, Germany
- Georgia Institute of Technology, Atlanta, GA, USA
- KFUPM University, Dhahran, Saudi Arabia
- University of Copenhagen, Denmark

Advisory & Examination Activities

PhD students (examiner)

- Subhajit Das, Georgia Institute of Technology, 2020
“Empowering Users to Communicate Their Preferences to Machine Learning Models in Visual Analytics”
- Md Mobashir Hasan Shandhi, Georgia Institute of Technology, 2020
“Non-Invasive Cardiovascular Health Monitoring for Patients with Heart Failure Using Seismo-cardiography”
- Giancarlo Valentin, Georgia Institute of Technology, 2019
“Wearable Interfaces for Symbolic Communication by Working Dogs”
- Xiaoxuan Lu, University of Oxford, 2019
“Robustly Inferring Identity across Digital and Physical Worlds”
- Weihao Cheng, University of Melbourne, Australia, 2018
“Accurate And Efficient Human Activity Recognition”
- Aneeq Zia, Georgia Institute of Technology, 2018
“Automated Benchmarking Of Surgical Skills Using Machine Learning”
- James Fisher, Newcastle University, 2014
“Objective Assessment of Upper Limb Motor Symptoms in Parkinson’s Disease Using Body-worn Sensors”

- Yachna Sharma, Georgia Institute of Technology, 2014
“Surgical Skill Assessment using Motion Texture Analysis”
- David Kim, Newcastle University, 2014
“Freeform 3D Interactions in Everyday Environments”
- Tom Bartindale, Newcastle University, 2013
“Interaction Design for Situated Media Production Teams”
- Carl Fischer, Lancaster University, 2012
“Localisation, Tracking and Navigation support for Pedestrians in Non-Instrumented and Unknown Environments”
- Kaustubh Kalgaonkar, Georgia Institute of Technology, 2011
“Probabilistic Space Maps for Speech with Applications”
- Bert Arnrich, Bielefeld University, 2006
“Data Mart Based Research in Heart Surgery”

PhD students – Georgia Institute of Technology ((co-)advisor)

- Harish Haresamudram (2019 –)
ECE PhD program
“Unsupervised Pattern Mining in Large Scale Activity Data” (working title)
co-advised with Irfan Essa
- Hong Li (2017 –)
CS PhD program, Intelligent Systems specialization
“Activity Recognition using Wearables” (working title)
co-advised with Gregory Abowd
- Daniel Scarafoni (2018 –)
ML PhD program
“Duality in Activity Recognition” (working title)
co-advised with Irfan Essa
- Hyeokhyen Kwon (2016 –)
CS PhD program, Intelligent Systems specialization
“Toward modeling real-world uncertainties in human activity recognition with wearable and ambient sensors” (working title)
co-advised with Gregory Abowd
- Shruthi Hiremath (2018 –)
CS PhD program, Intelligent Systems specialization
“Activity Recognition in Health” (working title)
- Mehrab Bin Morshed (2016 –)
CS PhD program, Human Computer Interaction specialization
“Mental Health Assessments through Passive and Active Sensing” (working title)
co-advised with Gregory Abowd

PhD students – Newcastle University ((co-)advisor)

- Maarten Vanhoof (completed 2018)
“Understanding the Role of Personal Networks Influence in Travel Behaviour using Large-scale Mobile Sensing” (main advisor)
now: post-doctoral researcher at University College London, UK
- Robin Thompson (completed 2018)
“Computational Behaviour Analysis in Livestock and its Applications to Disease Prediction and Prevention” (co-advisor with Ilias Kyriazakis)
now: self-employed (consultant on data analysis)
- Reuben Kirkham (completed 2016)
“Quantitative Assessment of Problem Behaviour in Individuals with Developmental Disabilities” (co-advisor with Patrick Olivier)
now: Lecturer at Monash University, Australia

- Diana Nowacka (completed 2016)
“Autonomous Behaviour in Tangible User Interfaces as a Design Factor” (co-advisor with David Kirk)
now: Embedded Software Engineer at Entia Ltd., London, UK
- Nils Hammerla (completed 2014)
“Activity Recognition in Naturalistic Environments using Body-Worn Sensors” (main advisor)
now: Cortex Applied Research @Twitter; formerly Machine Learning lead at Babylon Health, London, UK
- Cuong Pham (completed 2012)
“Human Activity Recognition for Pervasive Interaction” (co-advisor with Patrick Olivier)
now: faculty at Posts and Telecommunication Institute of Technology, Hanoi, Vietnam

PhD students – TU Dortmund University (co-advisor)

- Kai Lienemann (completed 2011)
“Automatic Classification of NMR Spectra” (co-advisor with G. A. Fink)
now: Arvato Distribution GmbH, Germany
- Jan Richarz (completed 2012)
“Gesture Recognition for Smart Environments” (co-advisor with G. A. Fink)
now: Elektron Systeme and Komponenten GmbH, Germany

Diploma (MSc) students – TU Dortmund University

- Sebastian Stein: “Face Recognition Based on Interest Points”
- Nils Hammerla: “Learning Robust Feature Extraction for Offline Handwriting Recognition”
- Christian Kleine-Cosack: “Human Aware Ambient Intelligence”
- Tobias Ramforth: “Detection of Handwritten Texts in Video Sequences”
- Marius Hennecke: “Development of a System for Localization of a Steered Audio Source” / “Calibration of Distributed Microphone Arrays”
- Andrea Torres Velasco: “Single Shot Face Recognition”

Diploma (MSc) students – Bielefeld University

- Christian Plahl: “Speech Synthesis with HMMs”
- Kai Lienemann: “Automatic Classification of NMR Spectra”

MSc students – Georgia Institute of Technology

- Will Bartlett: “Deep Learning based VO₂ Estimation from Body-Worn Sensor Data” (2020)
- Chia Hsieh: “Safer Public Transit in Atlanta” (2019-20)
- Gaurav Rajeev Tamhan: “Safer Public Transit in Atlanta” (2019-20)
- Tsung-Yi Wu: “Safer Public Transit in Atlanta” (2019-20)
- Raghu Teja Mulukutla: “Real-Time Prediction of Marijuana Use and Effects on Daily Cognitive Functioning” (2019-20)
- Harish Haresamudram: “Recurrent network architectures for human activity recognition” (2018-19)
- Chaitra Hegde: “Paying Attention to LSTMs” (2018-19)
- Jian Ruan: “Smart Home Control With AR interface” (2018)
- Vedant Das Swain: “Divine Interruptions – Context-Aware Ecological Momentary Assessment for Tracking Well-being” (2018)
- Kriti Nelavelli: “HandWhich Using Unlocking mechanisms to Determine Handedness of mobile devices” (2017-18) – **best project award**
- Ishaani Mittal: “Towards developing a system to help players learn the sport of badminton.” (2018-19)
- Shishir Chawla: “Personalization of HMM-based Activity Recognition Systems” (2017-18)

- Xuewen Yao: “Prediction of Maternal Depression through Wearable Sensing” (2017-18)
- Brent Zucker: “Intelligible Deep Learning” (2017-18)

Undergraduate students (dissertation advisor) – Georgia Institute of Technology

- Caleb Rudicki: “Interacting with a Smart Jacket” (2019-19)
- Yuchen Cao: “Data Augmentation for Sensor-based Human Activity Recognition” (2018-19)
- Shi Mengyang: “Effective Human Activity Recognition Toolkit for Mobile Platforms” (2017-18)
- Vishvak Murahari: “Large Scale Feature Learning for Activity Recognition” (2018)

MSc students – Newcastle University

- Hanqing Ding “Activity Recognition in the Cloud” (2016)
- Ioannis Petridis “Blobsnake: Gamefication of Human Activity Recognition” (2016)
- Jiajie Pan “Web-based video / image annotation tool” (2016)
- Yuhao Gu “Mesh Pi – Development of ad hoc networks for Raspberry Pies” (2016)
- Mohamed Elbagir Osman Elhassan “Automatic Recognition of Modes of Transportation using Wearable Computing” (2015)
- Bing Zhai “A Case Study of SNAP (SyNdetic Assistance Processes) based Intelligent Cooking Task Prompting System for Student” (2015)
- Tong Ou: “Automatic Synchronisation of Accelerometer and Video Data” (2014)
- Xiang Liu: “A mobile app for managing food in refrigerator” (2014)
- Adam McCormick: “An investigation into user interfaces for adults with learning disabilities.” (2014)

BSc students – Newcastle University

- Tom Ford: “Cycling Activity Recognition” (2015/16)
- Chris Brown: “Music Genre Classification” (2015/16)
- Jon Bowman: “Personalised Activity Tracking on a Smartwatch” (2015/16)
- Stuart McDaniel: “Attacking PIN-entry using Wearable Technology” (2015/16)
- Sophie Buckle: “What can your dog tell us about your health?” (2014/15)
- Takehiro Kakimura: “Towards Situated Cueing for Stroke Rehabilitation using Smartwatches” (2014/15)
- Lazar Valkov: “Automated organ segmentation in images of pig red offal” (2014/15)
- Mariusz Zacharejko: “Mobile Activity Annotation Tool” (2013/14)
- Samrith Shankar: “Development of a mobile, HTML5 based viewer for sensor and activity data” (2013/14)
- Marc Craven: “Universal Access to Household Appliances through Mobile Computing” (2013/14)
- Mantas Grublys: “Prototype of the Embedded smartJUG System” (2012/13)
- Samuel Mitchell Finnigan: “Energy Feedback – Motivating Behaviour Change In Energy Consumption using Human Occupancy & Energy Consumption Data” (2012/13)
- Arturas Zubkovas: “A Smartjug Dehydration Warning System (Wireless)” (2012/13)

Research Income (list of externally funded projects)

Overview

- Total number of grants: 34
- Total amount: approx. \$24.8m
- **Total split (personal share): approx. \$3.2m**

Note: Amounts of awards are given in local currency of the country where they have been awarded, plus conversion to US Dollar using exchange rate at the time when the award was made.

G34: Smart Homes for Effective and Safe Remote Work During a Pandemic and Beyond – \$171,653

- CISCO
- Organization: Georgia Institute of Technology
- Duration: 01/01/2021 – 12/31/2021
- Role: PI
- Objective: Develop and deploy methods for recognizing stress in home working environments through sensing and machine learning.

G33: Human-in-the-Loop Learning for Realization for Real-World AI – \$210,422

- KDDI
- Organization: Georgia Institute of Technology
- Duration: 07/01/2020 – 06/30/2021
- Role: Co-PI (split: 50% – \$105,211)
- Objective: Develop and deploy methods for explainable AI and human-in-the-loop AI in activity recognition scenarios in smart homes.

G32: Human Robot Interaction in a Manufacturing Setting – \$100,000

- Hitachi (unrestricted gift)
- Organization: Georgia Institute of Technology
- Duration: 07/01/2020 – 06/30/2021
- Role: Co-PI (split: 50% – \$50,000)
- Objective: Develop means to assess the behaviour and performance of factory workers in an assembly scenario

G31: Detecting Food Insecurity and Measuring its Impact on College Students – \$23,000

- GVU (Georgia Tech)
- Organization: Georgia Institute of Technology
- Duration: 09/01/2019 – 8/31/2020
- Role: PI (split: 50% – \$11,500)
- Objective: Develop means to detect and measure the impact of food insecurity in college students through passive sensing.

G30: Human Robot Interaction in a Manufacturing Setting – \$150,000

- Hitachi (unrestricted gift)
- Organization: Georgia Institute of Technology
- Duration: 07/01/2019 – 06/30/2020
- Role: Co-PI (split: 50% – \$75,000)
- Objective: Develop means to assess the behaviour and performance of factory workers in an assembly scenario.

G29: Automated Behavior Assessments through Body-Worn Movement Sensors and Machine Learning – \$20,223

- National Health Institutes
- Organization: Georgia Institute of Technology
- Duration: 07/01/2019 – 06/30/2020
- Role: PI
- Objective: Develop pattern discovery methods for improved human activity recognition in Autism

G28: Prolonged Exposure Collective Sensing System (PECSS) for PTSD – \$1,200,000

- National Science Foundation
- Organization: Georgia Institute of Technology
- Duration: 09/01/2019 – 08/31/2023
- Role: Co-PI (split: 25% – \$240,000)
- Objective: Develop automated means to improve treatment for PTSD patients.

G27: Developing the Jaquard Toolkit – \$50,000

- Google
- Organization: Georgia Institute of Technology
- Duration: 08/01/2019 – 07/31/2020
- Role: PI
- Objective: Develop a software toolkit and methods for gesture based interaction with a smart jacket.

G26: Learning a Lexicon of Human Movements from Large Scale Accelerometry – \$63,026

- Google
- Organization: Georgia Institute of Technology
- Duration: 08/01/2019 – 07/31/2020
- Role: PI
- Objective: Develop machine learning techniques for large scale analysis of accelerometry data with the goal of learning a universal representation of human movements.

G25: EAGER: Leveraging Behavioral and Physiological Feedback in the Design of Affect-Sensitive Distance Learning – \$300,000

- National Science Foundation (NSF)
- Organization: Georgia Institute of Technology
- Duration: 09/01/2018 – 08/31/2020
- Role: Co-PI (split: 33% – \$100,000)
- Objective: Investigate the feasibility of using wearable technologies and other types of sensing to gather more context about online learners.

G24: Deep Learning for Health Assessments – \$3,400

- nVIDIA (unrestricted gift)
- Organization: Georgia Institute of Technology
- Duration: 07/01/2017 –
- Role: PI (split: 100% – \$3,400)
- Objective: Develop and validate human behavior assessment methods using Deep Learning Techniques and modern GPU hardware.

G23: Objective measurement of challenging behaviors in individuals with ASD – \$388,802

- National Institutes of Health Research
- Organization: Georgia Institute of Technology
- Duration: 02/01/2017 – 01/31/2019
- Role: Co-PI (split to home organization: \$209,622)
- Objective: Develop and validate the first, automated approach to directly measure (through body-worn sensing and novel machine learning based analysis methods) the frequency and intensity of self-injurious, aggressive, and disruptive behaviors in individuals with ASD.

G22: Health assessments with wrist worn sensors – \$3,000

- Microsoft Research (unrestricted gift)
- Organization: Newcastle University
- Duration: 07/01/2017 –
- Role: PI (split: 100% – \$3,000)

- Objective: Develop and validate human activity recognition methods based on a wrist-worn sensing platform.

**G21: IAA: SAM-CLOUD: Secure farm Animal Monitoring in the CLOUD – £14,053.24
[~\$18,971.87]**

- Biotechnology and Biological Sciences Research Council (BBSRC)
- Organisation: Newcastle University
- Duration: 01/08/2016 – 31/01/2017
- Role: PI (split: 50% – £7k [~\$9.5k])
- Objective: Development of robust/secure IoT infrastructure for behaviour monitoring on farm.

**G20: IAA: Towards Automated Behaviour Monitoring in Commercial Farm Settings – £13,039
(approx. \$19,559)**

- Biotechnology and Biological Sciences Research Council (BBSRC)
- Organisation: Newcastle University
- Duration: 01/01/2016 – 30/06/2016
- Role: PI (split: 50% – £6.5k [\$9,779])
- Objective: Apply currently developed automated behaviour analysis method for validation at commercial, industry scale farm facilities.

G19: DERC: Digital Economy Research Centre – £4.1m (approx. \$6.15m)

- Engineering and Physical Sciences Research Council (EPSRC)
- Organisation: Newcastle University
- Duration: 01/10/2015 – 30/09/2020
- Role: CI (split: 3% – £121.5k [\$182,250])
- Objective: DERC will theorise, design, develop, and evaluate new digitally mediated models of citizen participation that engage communities, the third sector, local government and (crucially) the commercial digital economy in developing the future of local service provision and local democracy. DERC will deliver a sustained program of multi- and cross- disciplinary research using research methods that are participatory, action-based, and embedded in the real world. The research approach will operate across multiple scales (e.g. individual, family, community, institution) and involve long-term embedded research activity at scale.

G18: CRITiCaL - Combatting cRiminals In The CLoud – £2,534,557 (approx. \$3,801,836)

- Engineering and Physical Sciences Research Council (EPSRC)
- Organisation: Newcastle University (in collaboration w/ Durham University)
- Duration: 01/6/2015 – 31/05/2020
- Role: CI (split: 15% [of Newcastle share £1,178,126.61] – £176.7k [\$265,078])
- Objective: Within this project we seek to understand the different types of crime that can happen in the Cloud, build systems that will allow the detection of this criminal behaviour and enable the use of digital evidence to lead to successful prosecution of Cloud crime perpetrators.

G17: SEET: Sensor-enhanced ethnographic tools for media production – £23,167 (approx. \$34,751)

- British Broadcasting Corporation (BBC) Research
- Organisation: Newcastle University
- Duration: 01/10/2015 – 30/09/2019
- Role: PI (split: 100% – £23.2k [\$34,751])
- Objective: PhD iCASE studentship to support Gerard Wilkinson in researching the convergence of media tools and methodologies used at the professional and user ends of an IP-enabled media chain. The key research challenge is the development of a radical ethnography tool and method (SEET) that embeds sensors in production environments for traditional

TV/radio and digital media, and uses novel context-aware computing algorithms to semi-automatically segment and interpret sensor data.

G16: Parkinson's disease assessment in ecologically valid settings using wearable sensors – £17,755 (approx. \$26,633)

- Funder: Medical Research Council (MRC), UK
- Organisation: Newcastle University
- Duration: 01/01/2015 – 30/06/2015
- Role: CI (split: 50% -- £8,877.50 [\$13,316])
- Objective: Refinement of algorithms for assessing different types of movement disorder in Parkinson's disease (PD) patients to facilitate more accurate clinical disease assessment and management combined with user-centred design of client and server side technologies and interfaces for easy and future proof data uploading (by patients and carers) and results analysis for clinical assessment. Proof-of-concept deployment of device and interface in a home/clinical environment to assess end-to-end feasibility of deployment.

G15: Protocol development and clinical trial feasibility evaluation of a wrist-worn accelerometer to monitor, prompt and report impaired upper limb activity during self-supervised rehabilitation after stroke – £209,994.16 (approx. \$314,991)

- Funder: Stroke Association, UK
- Organisation: Newcastle University
- Duration: 01/10/2014 – 30/09/2017
- Role: CI (split: 10% – £20,999.4 [\$31,499])
- Objective: Develop situated prompting for upper limb rehabilitation exercises in stroke patients and automatically assess quality of such exercises.

G14: A Catalyst for Automated Capture and Analysis of Behaviour and Performance Changes in Pigs for Early Detection of Health and Welfare Problems – £587,011 (approx. \$880,516)

- Funder: Technology Strategy Board (TSB)
- Organisation: Newcastle University
- External collaborators: Zoetis Inc., Harbro, Innovent, RAFT
- Duration: 01/10/2014 – 28/02/2018
- Role: CI (split: 50% – £293,505.5 [\$440,258])
- Objective: Develop/validate technology to automatically monitor performance & behaviour in growing pigs on farm for early disease detection with application to animal health & welfare.

G13: Automated screening for pathologies at abattoir through computer vision based inspection of pig carcasses – £175,047.99 (approx. \$162,572)

- Funder: Technology Strategy Board (TSB)
- Organisation: Newcastle University
- External collaborators: Tulip Ltd., Hellenic Systems, Dundee University
- Duration: 01/2/2014 – 31/01/2017
- Role: PI (split: 55% – £96,276.40 [\$144,415])
- Objective: Develop novel pattern recognition techniques for the automatic recognition of pathologies in pig carcasses at the production line in abattoirs.

G12: Evaluation of physical functioning in adults treated for bone and soft tissue sarcomas – a feasibility study of two new technologies – £7,057.97 (approx. \$10,586.96)

- Funder: Sarcoma UK
- Organisation: Newcastle University
- Duration: 01/04/2014 – 30/08/2014
- Role: CI (split: 60% – £4,234.78 [\$6,352])

- Objective: Evaluate physical functioning for bone-cancer survivors (adults) using body-worn sensing and machine learning techniques

G11: MyPLACE: M(obility) (& PL(ace for the) A(ge-friendly) C(ity) E(nvironment) – £1,011,005.27 (approx. \$1,516,508)

- Funder: Engineering and Physical Sciences Research Council (EPSRC)
- Organisation: Newcastle University
- Duration: 01/3/2014 – 28/02/2017
- Role: CI (split: 10% – £101,100.53 [\$151,651])
- Objective: Develop and test through real-world research, a digital platform and toolkit that will enable members of the public to engage with local councils and other organisations more effectively in the research, planning and design of the urban environment.

G10: Understanding the Role of Personal Networks Influence in Travel Behaviour Using Large Scale Mobile Sensing – £22,222 (approx. \$33,333)

- Funder: Orange
- Organisation: Newcastle University
- Duration: 01/11/2013 – 31/10/2016
- Role: PI (split: 80% – £17,777 [\$26,666])
- Objective: PhD studentship for Maarten Vanhoof to develop and deploy methods for automated analysis of large scale mobile phone call records with regards to travel and commuting behaviour analysis.

G9: Functional evaluation of survivors of paediatric bone and soft tissue tumours – a pilot study of two new technologies – £11,761.29 (approx. \$17,642)

- Funder: Children with Cancer UK
- Organisation: Newcastle University
- Duration: 01/04/2013 – 31/03/2014
- Role: CI (split: 60% – £7,056.77 [\$10,585])
- Objective: Evaluate physical functioning for bone-cancer survivors (children) using body-worn sensing and machine learning techniques

G8: Energy reduction through Promoting Sustainable Living – £56,379 (approx. \$84568.5)

- Funder: Engineering and Physical Sciences Research Council (EPSRC)
- Ext. collaborators: Tsinghua University Beijing, PRC; Microsoft Research Asia, Beijing, PRC
- Organisation: Newcastle University
- Duration: 01/11/2012 – 31/03/2013
- Role: PI (split: 60% – £33,827.40 [\$50,741])
- Objective: Investigate effectiveness of behaviour monitoring and interaction techniques for promoting sustainable living with focus on cross-cultural understanding in western societies and those of growing economies.

G7: Towards Automatic Analysis of Behaviour Changes in Livestock as a Tool for Early Disease Prediction – £27,231 (approx. \$40,847)

- Funder: Engineering and Physical Sciences Research Council (EPSRC) – TSB prep. award
- Organisation: Newcastle University
- Duration: 01/11/2012 – 31/03/2013
- Role: PI (split: 60% – £16,338.60 [\$24,508])
- Objective: Develop prototypical sensing and data analysis techniques for automatic behaviour analysis of farm animals with the objective of early disease prediction.

G6: Discriminative Statistical Models for Multi-Modal Behavioral Assessment and Measurement in Social Interactions – € 90,000 (approx. £80,000; approx. \$120,000)

- Funder: German Research Foundation (DFG)
- Duration: 01/2/2011 – 30/01/2012.
- Organisation: Georgia Institute of Technology
- Role: Research Fellow (split: 100% – £80,000 [\$120,000])
- Objective: Develop modelling techniques for automatic, multi-modal analysis of social interactions in a clinical setting of Autism screening in toddlers.

G5: Using Accelerometer-based Activity Recognition to Improve Motor Performance in Parkinson's Disease – £27,231.61 (approx. \$40,847)

- Funder: Knowledge Transfer Account (EPSRC)
- Organisation: Newcastle University
- Duration: 01/2/2011 – 30/01/2012.
- Role: Co-author of proposal and research associate
- Objective: Develop automated quality assessment of human activities with application to surgical skill training for medical students.

G4: TEDDI: Building Management and Energy Demand, Distributed Conversion and Storage using Dynamic Modelling and a Pervasive Sensor Infrastructure – £606,679 (approx. \$910,018)

- Funder: Engineering and Physical Sciences Research Council (EPSRC)
- Organisation: Newcastle University
- Duration: 01/9/2010-31/08/2013.
- Role: CI (split: 25% – £151,669.75 [\$227,504])
- Objective: Design & develop pervasive sensing infrastructure and behaviour analysis techniques providing fine-grained information about energy use in commercial/residential buildings.

G3: Camera Based Whiteboard Reading – €290,000 (approx. £250,000; approx. \$322,500)

- Funder: German Research Foundation (DFG)
- Organisation: TU Dortmund University
- Duration: 01/04/2007 – 31/03/2010)
- Role: CI (split: 50% – 125,000 [\$161,250])
- Objective: Develop modelling & interaction techniques for autom. analysis of whiteboard notes

G2: ACON: Automatic Classification of NMR Spectra – €60,000 (approx. £52,000; approx. \$78,000)

- Funder: Boehringer Ingelheim Pharma GmbH & Co KG
- Organisation: TU Dortmund University
- Duration: 01/12/2005 – 30/11/2009
- Role: Executive project leader / CI (split: 50% – £25,500 [\$39,000])
- Objective: Develop pattern recognition methods for automated analysis of NMR spectra with pharmaceutical applications

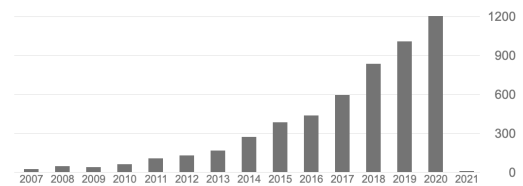
G1: GRASSP: Genetic Relationship Analysis Based on Statistical Sequence Profiles – €250,000 (approx. £215,000; approx. \$322,500)

- Funder: Boehringer Ingelheim Pharma GmbH & Co KG
- Organisation: TU Dortmund University
- Duration: 01/11/2002 – 30/04/2006
- Role: Proposal author and principal scientist
- Objective: Develop novel HMM-based pattern recognition methods for the detection of members of pharmaceutically relevant protein families

Publications

Metrics (Google scholar)

- Total number of peer reviewed publications: 151
- Total number of citations: 5,452
- H-index: 36
- I10-index: 92



Books and Book Chapters (4)

- [B1] T. Plötz (2005) *Advanced Stochastic Protein Sequence Analysis*. In Faculty of Technology, Bielefeld University.
- [B2] T. Plötz, G. A. Fink, S. A. Mahmoud, S. Vajda (Eds.) (2010) *Frontiers in Arabic Handwriting Recognition* (workshop proceedings).
- [B3] T. Plötz, P. Moynihan, C. Pham, P. Olivier (2010) *Activity Recognition and Healthier Food Preparation*. In Activity Recognition in Pervasive Intelligent Environments. Atlantis Press.
- [B4] T. Plötz, G. A. Fink (2011) *Markov Models for Handwriting Recognition*, Springer.
- [B5] Y. Gao, Y. Long, Y. Guan, A. Basu, J. Baggaley, T. Plötz (2020) *Automated General Movement Assessment for Perinatal Stroke Screening in Infants* In Smart Assisted Living. Springer.

Journal Articles (59)

- [J1] Bin Morshed, Mehrab and Kulkarni, Samruddhi and Li, Richard and Saha, Koustuv and Galante, Leah and Nachman, Lama and Mirabella, Lucia and Srivastava, Sanjeev and Lu, Hong and de Barbaro, Kaya and De Choudhury, Munmun and Ploetz, Thomas and Abowd, Gregory (2021) "A Real-Time Eating Detection System for Capturing Eating Moments and Triggering Ecological Momentary Assessments to Obtain Further Context: System Development and Validation Study" *JMIR mHealth and uHealth*. (in press)
- [J2] Khan, Aftab and Mellor, Sebastian and King, Rachel and Janko, Balazs and Harwin, William and Sherratt, R. Simon and Craddock, Ian and Ploetz, Thomas (2021) "Generalized and Efficient Skill Assessment from IMU Data with Applications in Gymnastics and Medical Training" *ACM Trans. Comput. Healthcare* (in press).
- [J3] Hiremath K., Shruthi; Ploetz, Thomas (2020) "Deriving Effective Human Activity Recognition Systems through Objective Task Complexity Assessment" *Proc. ACM Interactive, Mobile, Wearable and Ubiquitous Computing (IMWUT)*, vol 4, number 4.
- [J4] Kwon, Hyeokhyen; Tong, Catherine; Haresamudram, Harish; Gao, Yan; Abowd, Gregory D; Lane, Nicholas D; Ploetz, Thomas (2020) "IMUTube: Automatic extraction of virtual on-body accelerometry from video for human activity recognition", *Proc. ACM Interactive, Mobile, Wearable and Ubiquitous Computing (IMWUT)*, vol 4, number 3.
- [J5] Shandhi, Md Mobashir Hasan; Bartlett, William H; Heller, James; Etemadi, Mozziyar; Young, Aaron; Ploetz, Thomas; Inan, Omer; (2020) "Estimation of Instantaneous Oxygen Uptake during Exercise and Daily Activities using a Wearable Cardio-Electromechanical and Environmental Sensor", *IEEE Journal of Biomedical and Health Informatics*.
- [J6] B. Little, O. Alshabrawy, D. Stow, I. N. Ferrier, R. McNaney, D. G Jackson, K. Ladha, C. Ladha, T. Ploetz, J. Bacardit, P. Olivier, P. Gallagher, J. T O'Brien, "Deep learning-based automated speech detection as a marker of social functioning in late-life depression", *Psychological Medicine*, 2019
- [J7] Y. Gao, Y. Long, Y. Guan, A. Basu, J. Baggaley, T. Ploetz (2019) "Towards Reliable, Automated General Movement Assessment for Perinatal Stroke Screening in Infants Using Wearable Accelerometers", *Proc. ACM on Interactive, Mobile, Wearable, and Ubiquitous Computing (IMWUT)*. vol 3, no. 1

- [J8] X. Yao, T. Plötz, M. Johnson, K. de Barbaro (2019) “Automated Detection of Infant Holding Using Wearable Sensing: Implications for Developmental Science and Intervention”, *Proc. ACM on Interactive, Mobile, Wearable, and Ubiquitous Computing (IMWUT)*. vol 3, no. 2
- [J9] M. Bin Morshed, K. Saha, R. Li, S. D’Mello, M. De Choudhury, G. D Abowd, T. Plötz (2019), “Prediction of Mood Instability with Passive Sensing”, *Proc. ACM on Interactive, Mobile, Wearable, and Ubiquitous Computing (IMWUT)*. vol 3, no. 3
- [J10] R. J Thompson, S. Matthews, T. Plötz, I. Kyriazakis (2019) “Freedom to lie: How farrowing environment affects sow lying behaviour assessment using inertial sensors”, *Computers and electronics in Agriculture*, vol. 157, pp: 549–57.
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- [J12] T. Ploetz and J. Healey (2018), “ISWC 2017: Riding the Waves of Wearables,” *IEEE Pervasive Computing*, vol. 17, no. 2, pp. 78–83, Jun.
- [J13] M. Vanhoof, F. Reis, T. Ploetz, and Z. Smoreda, (2018) “Assessing the Quality of Home Detection from Mobile Phone Data for Official Statistics,” *Journal of Official Statistics*, vol. 34, no. 4, pp. 935–960, Dec.
- [J14] J. Cowton, I. Kyriazakis, T. Ploetz, and J. Bacardit, (2018) “A Combined Deep Learning GRU-Autoencoder for the Early Detection of Respiratory Disease in Pigs Using Multiple Environmental Sensors,” *Sensors*, vol. 18, no. 8, pp. 2521–20, Aug.
- [J15] S. McKenna, T. Amaral, T. Ploetz, and I. Kyriazakis, (2018) “Multi-part segmentation for porcine offal inspection with auto-context and adaptive atlases,” *Pattern Recognition Letters*, pp. 1–11, Jul.
- [J16] M. Vanhoof, W. Schoors, A. Van Rompaey, T. Ploetz, and Z. Smoreda, (2018) “Comparing Regional Patterns of Individual Movement Using Corrected Mobility Entropy,” *Journal of Urban Technology*, vol. 0, no. 0, pp. 1–35, May.
- [J17] R. H. Da-Silva, F. van Wijck, L. Shaw, H. Rodgers, M. Balaam, L. Brkic, T. Ploetz, D. Jackson, K. Ladha, and C. I. Price, (2018) “Prompting arm activity after stroke: A clinical proof of concept study of wrist-worn accelerometers with a vibrating alert function,” *Journal of Rehabilitation and Assistive Technologies Engineering*, vol. 5, pp.1–8, May.
- [J18] T. Ploetz and Y. Guan (2018), “Deep Learning for Human Activity Recognition in Mobile Computing,” *IEEE Computer*, vol. 51, no. 5, pp. 50–59.
- [J19] Ahmed Kharrufa, Thomas Ploetz, and Patrick Olivier (2018), “A Unified Model for User Identification on Multi-Touch Surfaces: A Survey and Meta-Analysis” . *ACM Transactions on Computer-Human Interaction (TOCHI)*, vol. 24, issue 6, article 39.
- [J20] S. Nabil, D. S. Kirk, T. Ploetz, and P. C. Wright (2017), “Designing Future Ubiquitous Homes with OUI Interiors - Possibilities and Challenges.,” *Interaction Design and Architectures*, vol. 2017, no. 32, pp. 28–37.
- [J21] J. Rusakovica, V. D. Kremer, T. Ploetz, P. Rohlf, and I. Kyriazakis (2017), “The genetic basis of novel water utilisation and drinking behaviour traits and their relationship with biological performance in turkeys,” *Genetics Selection Evolution*, pp. 1–10, Sep.
- [J22] S. G. Matthews, A. L. Miller, T. Ploetz, and I. Kyriazakis (2017), “Automated tracking to measure behavioural changes in pigs for health and welfare monitoring,” *Nature Scientific Reports*, vol. 7, no. 1, pp. 1–12, Dec.
- [J23] Nabil, Sara, Kirk, David, Ploetz, Thomas and Wright, Peter (2017). “Designing Future Ubiquitous Homes with OUI Interiors: Possibilities and Challenges”. *Interaction Design and Architecture(s)*, 32. Pp. 28–37
- [J24] Y. Guan, T. Ploetz (2017). “Ensembles of Deep LSTM Learners for Activity Recognition using Wearables”. *Proc. ACM on Interactive, Mobile, Wearable, and Ubiquitous Computing (IMWUT)*. vol 1, no. 2.
- [J25] Cheng Zhang, Anandghan Waghmare, Pranav Kundra, Yiming Pu, Scott Gilliland, Thomas Ploetz, Thad E Starner, Omer T Inan, Gregory D Abowd (2017). “FingerSound: Recognizing

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- [J27] Aftab Khan, James Nicholson, Thomas Plötz (2017). “Activity Recognition for Quality Assessment of Batting Shots in Cricket using a Hierarchical Representation”, *Proc. ACM on Interactive, Mobile, Wearable, and Ubiquitous Computing (IMWUT)*. Vol 1, no 3.
- [J28] G. M. Ramdharry, A. J. Pollard, R. Grant, E. L. Dewar, M. Laurá, S. A. Moore, K. Hallsworth, T. Ploetz, M.I.I. Trenell & M. M. Reilly (2016), “A study of physical activity comparing people with Charcot-Marie-Tooth disease to normal control subjects”, *Disability and Rehabilitation*, vol 39, no. 17, pp. 1753–58.
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- [J31] D. P. Bailey, S. J. Charman, T. Ploetz, L. A. Savory, and C. J. Kerr (2016), “Associations between prolonged sedentary time and breaks in sedentary time with cardiometabolic risk in 10–14-year-old children: The HAPPY study,” *J. Sports Sci*.
- [J32] S. A. Moore, R. Da Silva, M. Balaam, L. Brkic, D. Jackson, D. Jamieson, T. Ploetz, H. Rodgers, L. Shaw, F. van Wijck, and C. Price (2016), “Wristband Accelerometers to motivate arm Exercise after Stroke (WAVES): study protocol for a pilot randomized controlled trial,” *Trials*, vol. 17, no. 1.
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- [J34] J. M. Fisher, N. Y. Hammerla, T. Ploetz, P. Andras, L. Rochester, and R. W. Walker (2016), “Unsupervised home monitoring of parkinson’s disease motor symptoms using body-worn accelerometers,” *Parkinsonism Relat. Disord.*, pp. 6–12.
- [J35] J. T. O’Brien, P. Gallagher, D. Stow, N. Hammerla, T. Ploetz, M. Firbank, C. Ladha, K. Ladha, D. Jackson, R. McNaney, I. N. Ferrier, and P. Olivier (2016), “A study of wrist-worn activity measurement as a potential real-world biomarker for late life depression,” *Psychol. Med.*, pp. 1–10.
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- [J37] R. Thompson, S. M. Matheson, T. Plötz, S. A. Edwards, I. Kyriazakis (2016), “Porcine lie detectors: Automatic quantification of posture state and transitions in sows using inertial sensors”, *Computers and Electronics in Agriculture*, vol. 127, pp: 521 –30.
- [J38] A. Khan, E. Berlin, S. Mellor, R. Thompson, N. Hammerla, R. McNaney, P. Olivier, T. Plötz (2016), “How did I do?: Automatic Skill Assessment from Activity Data”, *ACM GetMobile: Mobile Computing and Communications*, vol. 19, no. 4, pp: 18–22.
- [J39] A. Khan, N. Hammerla, S. Mellor, T. Plötz (2016), “Optimising sampling rates for accelerometer-based human activity recognition”, *Pattern Recognition Letters*, vol. 73, pp: 33–40.
- [J40] S. Vajda, T. Plötz, and G. A. Fink (2015), “Camera-Based Whiteboard Reading for Understanding Mind Maps,” *Int. J. Pattern Recognit. Artif. Intell. (IJPRAI)*, vo. 29, no. 03.
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- [J42] K. Hallsworth, C. Thoma, S. Moore, T. Plötz, Q. M. Anstee, R. Taylor, C. P. Day, and M. I. Trenell (2014), “Non-alcoholic fatty liver disease is associated with higher levels of objectively measured sedentary behaviour and lower levels of physical activity than matched healthy controls,” *Front-line Gastroenterol.*
- [J43] M. Brown, T. Coughlan, T. Ploetz, P. Tolmie, and G. Abowd (2014), “Methods for Studying Technology in the Home,” *Interact. Comput.*
- [J44] S. Bhattacharya, P. Nurmi, N. Hammerla, T. Plötz (2014), *Using Unlabeled Data in a Sparse-coding Framework for Human Activity Recognition*, PMC, vol 15, pp. 242–262.
- [J45] S. J. Denton, M. I. Trenell, T. Plötz, L. A. Savory, D. P. Bailey, C. J. Kerr (2013) *Cardiorespiratory fitness is associated with hard and light intensity physical activity but not time spent sedentary in 10-14 year old schoolchildren: the HAPPY study*. In PLoS One 8 (1).
- [J46] S. A. Moore, K. Hallsworth, T. Plötz, G. A. Ford, L. Rochester, M. I. Trenell (2013) *Physical activity, physical inactivity and metabolic control following stroke: A cross sectional and longitudinal study*. In PLoS One 8 (1).
- [J47] P. Seedhouse, A. Preston, P. Olivier, D. Jackson, P. Heslop, T. Plötz, M. Balaam, S. Ali (2013) *The French Digital Kitchen: implementing task-based language teaching beyond the classroom*. In International Journal of Computer-Assisted Language Learning and Teaching.
- [J48] M. Kranz, A. Moeller, N. Hammerla, S. Diewald, L. Roalter, T. Plötz, P. Olivier (2012) *The mobile fitness coach: Towards individualized skill assessment using personalized mobile devices*. In Pervasive and Mobile Computing (PMC).
- [J49] S. Apabhai, G. S. Gorman, L. Sutton, J. L. Elson, T. Plötz, D. M. Turnbull, M. I. Trenell (2011) *Habitual physical activity in mitochondrial disease*. In PLoS One.
- [J50] J. L. Newton, J. Pairman, K. Hallsworth, S. Moore, T. Plötz, M. I. Trenell (2011) *Physical activity intensity but not sedentary activity is reduced in chronic fatigue syndrome and is related to autonomic regulation*. In Quarterly Journal of Medicine.
- [J51] J. Hoey, T. Plötz, D. Jackson, A. Monk, C. Pham, P. Olivier (2011) *Rapid specification and automated generation of prompting systems to assist people with dementia*, 299–318. In Pervasive and Mobile Computing 7 (3).
- [J52] S. Vajda, T. Plötz, G. Fink (2009) *Layout Analysis for Camera-Based Whiteboard Notes*, 3307–3324. In Journal of Universal Computer Science 15 (18).
- [J53] T. Plötz, G. Fink (2009) *Markov Models for Offline Handwriting Recognition: A Survey*, 269–298. In Int. Journal on Document Analysis and Recognition 12 (4).
- [J54] G. Fink, T. Plötz (2008) *Developing Pattern Recognition Systems Based on Markov Models: The ESMERALDA Framework*, 207–215. In Pattern Recognition and Image Analysis 18 (2).
- [J55] K. Lienemann, T. Plötz, S. Pestel (2008) *NMR-based urine analysis in rats: Prediction of proximal tubule kidney toxicity and phospholipidosis*, 41–49. In Journal of Pharmacological and Toxicological Methods 58 (1).
- [J56] T. Plötz, J. Richarz, G. Fink (2008) *Robust Hand Detection in Still Video Images Using a Combination of Salient Regions and Color Cues for Interaction With an Intelligent Environment*, 417–430. In Pattern Recognition and Image Analysis 18 (3).
- [J57] T. Plötz, G. Fink (2006) *Pattern Recognition Methods for Advanced Stochastic Protein Sequence Analysis using HMMs*, 2267–2280. In Pattern Recognition.
- [J58] J. Fritsch, M. Kleinhagenbrock, S. Lang, T. Plötz, G. Fink, G. Sagerer (2005) *Multi-Modal Anchoring for Human-Robot-Interaction*, 133–147. In Robotics and Autonomous Systems 43.
- [J59] T. Plötz, G. Fink (2005) *Robust Remote Homology Detection by Feature Based Profile Hidden Markov Models*. In Statistical Applications in Genetics and Molecular Biology 4 (1).

Refereed conference contributions (64)

- [C1] MB Morshed, K Saha, M De Choudhury, GD Abowd, T Plötz (2020) “Measuring Self-Esteem with Passive Sensing” *Proc. of the 13th EAI International Conference on Pervasive Computing Technologies for Healthcare (Pervasive Health)*.
- [C2] Wang, Qiaosi; Jing, Shan; Joyner, David; Wilcox, Lauren; Li, Hong; Plötz, Thomas; Disalvo, Betsy; “Sensing Affect to Empower Students: Learner Perspectives on Affect-Sensitive

Technology in Large Educational Contexts”, Proceedings of the Seventh ACM Conference on Learning@ Scale, 2020. **Best Paper Award**.

- [C3] Haresamudram, Harish; Beedu, Apoorva; Agrawal, Varun; Grady, Patrick L; Essa, Irfan; Hoffman, Judy; Plötz, Thomas; “*Masked reconstruction based self-supervision for human activity recognition*”, Proc. ACM Int. Symposium on Wearable Computing (ISWC), 2020. Acceptance rate: <30%.
- [C4] H. Kwon, G. D. Abowd, and T. Ploetz, “*Handling annotation uncertainty in human activity recognition*”, Proc. ACM Int. Symposium on Wearable Computing (ISWC), 2019. Acceptance rate: <30%.
- [C5] H. Haresamudram, D. Anderson, T. Ploetz, “*On the role of features in human activity recognition*”, Proc. ACM Int. Symposium on Wearable Computing (ISWC), 2019. Acceptance rate: <30%.
- [C6] P. Schmidt, R. Dürichen, A. Reiss, K. Van Laerhoven, T. Plötz “*Multi-target affect detection in the wild: an exploratory study*”, Proc. ACM Int. Symposium on Wearable Computing (ISWC), 2019. Acceptance rate: <30%
- [C7] H. Kwon, G. D. Abowd, and T. Ploetz, “*Adding structural characteristics to distribution-based accelerometer representations for activity recognition using wearables*”, Proc. ACM Int. Symposium on Wearable Computing (ISWC), 2018. Acceptance rate: <30%.
- [C8] J. Wu, C. Colglazier, A. Ravishankar, Y. Duan, Y. Wang, T. Ploetz, and T. Starner, “*Seesaw: Rapid One-handed synchronous gesture interfaces for smartwatches*”, Proc. ACM Int. Symposium on Wearable Computing (ISWC), 2018. Acceptance rate: <30%.
- [C9] H. Li, G. D. Abowd, ad T. Ploetz, “*On Specialized window lengths and detector based human activity recognition*”, Proc. ACM Int. Symposium on Wearable Computing (ISWC), 2018. Acceptance rate: <30%.
- [C10] H. Li, S. Chawla, R. Li, S. Jain, G. D. Abowd, T. Starner, C. Zhang, and T. Ploetz, “*WristWash: Towards automatic handwashing assessment using a wrist-worn device*”, Proc. ACM Int. Symposium on Wearable Computing (ISWC), 2018. Acceptance rate: <30%.
- [C11] V. Murahari, and T. Ploetz, “*On Attention Models for Human Activity Recognition*”, Proc. ACM Int. Symposium on Wearable Computing (ISWC), 2018. Acceptance rate: <30%.
- [C12] C. Zhang, Q. Xue, A. Waghmare, R. Meng, S. Jain, Y. Han, X. Li, K. A. Cunefare, T. Ploetz, T. Starner, O. T. Inan, and G. D. Abowd, “*FingerPing - Recognizing Fine-grained Hand Poses using Active Acoustic On-body Sensing.*,” Proc. SIGCHI Conf on Human Factors in Computing Systems (CHI), 2018. Acceptance rate: 25.7%
- [C13] S. Nabil, D. S. Kirk, T. Plötz, J. Trueman, D. Chatting, D. Dereshev, and P. Olivier, “*Interioractive : Smart Materials in the Hands of Designers and Architects for Designing Interactive Interiors,*” Proc. ACM Conf Des. Interact. Syst., pp. 379–390, 2017. Acceptance rate: 22%.
- [C14] K. Montague, D. Jackson, T. Brühwiler, T. Bartindale, G. Wilkinson, P. Olivier, O. Hilliges, and T. Ploetz, “*Prototyping Ubiquitous Imaging Surfaces,*” Proc. ACM Conf Des. Interact. Syst., pp. 203–207, 2017. Acceptance rate: 22%.
- [C15] S. Nabil, T. Plötz, and D. Kirk (2017), “*Interactive Architecture: Exploring and Unwrapping the Potentials of Organic User Interfaces,*” in Proc. Int. Conf. Tangible and Embedded Interaction (TEI). Acceptance rate: 27%.
- [C16] N. Hammerla, S. Halloran, T. Ploetz (2016). *Deep, Convolutional, and Recurrent Models for Human Activity Recognition using Wearables*. In Proc. IJCAI. Acceptance rate: 24%.
- [C17] T. Amaral, I. Kyriazakis, S. J. Mckenna, T. Ploetz, (2016). *Segmentation of organs in pig offal using auto-context*. In Proc. ISBI. Acceptance rate: 51.9%.
- [C18] T. Amaral, I. Kyriazakis, S. J. Mckenna, T. Ploetz, (2016). *Weighted atlas auto-context with application to multiple organ segmentation*. In Proc. WACV. Acceptance rate: 34%.
- [C19] Tudor Miu, Paolo Missier, Thomas Ploetz (2015). “*Bootstrapping Personalised Human Activity Recognition Models Using Online Active Learning*”. Proc. IUCC. Acceptance rate: 28.9%.
- [C20] Diana Nowacka, Nils Y. Hammerla, Chris Elsdén, Thomas Ploetz, David Kirk (2015). “*Diri - the Actuated Helium Balloon: A Study of Autonomous Behaviour in Interfaces*”. in Proc. UbiComp. Acceptance rate: 23%.

- [C21] Aftab Khan, Sebastian Mellor, Eugen Berlin, Robin Thompson, Patrick Olivier, Thomas Plötz (2015) *"Beyond Activity Recognition: Skill Assessment from Accelerometer Data"*, in Proc. UbiComp. Acceptance rate: 23%. **Honourable Mention Award** (top 5%)
- [C22] Robin Thompson, Ilias Kyriazakis, Patrick Olivier, Thomas Plötz (2015) *"Dancing with Horses: Automatic Quality Feedback for Dressage Riders"*, in Proc. UbiComp. Acceptance rate: 23%.
- [C23] Nils Hammerla, Thomas Plötz (2015) *"Let's (not) stick together: Pairwise Similarity Biases Cross-Validation in Activity Recognition"*, in Proc. UbiComp. Acceptance rate: 23%.
- [C24] Reuben Kirkham, Carlton Shepherd, Thomas Plötz (2015) *"BlobSnake: Gamification of Feature Extraction for 'Plug and Play' Human Activity Recognition"*, in Proc. British HCI. Acceptance rate: 45%.
- [C25] Amey Holden, Roisin McNaney, Madeline Balaam, Robin Thompson, Nils Hammerla, Thomas Plötz, Daniel Jackson, Christopher Price, Lianne Brkic, Patrick Olivier (2015) *"CueS: Cueing for Upper Limb Rehabilitation in Stroke"* in Proc. British HCI. Acceptance rate: 45%.
- [C26] Nils Hammerla, James Fisher, Peter Andras, Lynn Rochester, Richard Walker, Patrick Olivier, Thomas Plötz (2015) *"PD Disease State Assessment in Naturalistic Environments using Deep Learning"*, in Proc. AAAI. Acceptance rate: 26%. **Accessible Paper Award.**
- [C27] Aftab Khan, James Nicholson, Sebastian Mellor, Dan Jackson, Karim Ladha, Cassim Ladha, Jon Hand, Joe Clarke, Patrick Olivier, Thomas Plötz (2014) *Occupancy Monitoring using Environmental & Context Sensors and a Hierarchical Analysis Framework*, in Proc. BuildSys. Acceptance rate: 34%.
- [C28] Kim Willems, Randy Lauriers, Johannes Schoening, Antonio Krüger, Dan Jackson, Thomas Plötz, Patrick Olivier (2014), "Augmenting the servicescape with ubiquitous interactive surfaces: Fibreshelf technology". In Proc. AMA Servisg. Acceptance rate: 69%.
- [C29] Yachna Sharma, Thomas Plötz, Nils Hammerla, Sebastian Mellor, Roisin McNaney, Patrick Olivier, Sandeep Deshmukh, Andrew Mccaskie, Irfan Essa (2014) *Automated Surgical OSATS Prediction from Videos*. In Proc. IEEE Int. Symp. on Biomedical Imaging (ISBI). Acceptance rate: 49.2%. **Honorable Mention Award (Best Paper Candidate)**
- [C30] Vinay Bettadapura, Grant Schindler, Thomas Plötz, Irfan Essa (2013) *Augmenting Bag-of-Words: Data-Driven Discovery of Temporal and Structural Information for Activity Recognition*. In Proc. Int. Conf. Computer Vision and Pattern Recognition (CVPR). Acceptance rate: 26.2%
- [C31] Cassim Ladha, Nils Hammerla, Patrick Olivier, Thomas Plötz (2013) *ClimbAX: Skill Assessment for Climbing Enthusiasts*. In Proc. Int. Conf. Ubiquitous Comp. (UbiComp). Acceptance rate: 23%.
- [C32] Cassim Ladha, Nils Hammerla, Emma Hughs, Patrick Olivier, Thomas Plötz (2013) *Dog's Life: Wearable Activity Recognition for Dogs*. In Proc. Int. Conf. Ubiquitous Comp. (UbiComp). Acceptance rate: 23%.
- [C33] Cuong Pham, Daniel Jackson, Johannes Schoening, Tom Bartindale, Thomas Plötz, Patrick Olivier (2013) *FoodBoard: Surface Contact Imaging for Food Recognition*. In Proc. Int. Conf. Ubiquitous Comp. (UbiComp). Acceptance rate: 23%.
- [C34] Nils Hammerla, Reuben Kirkham, Peter Andras, Thomas Plötz (2013) *On Preserving Statistical Characteristics of Accelerometry Data using their Empirical Cumulative Distribution*. In Proc. Int. Symp. Wearable Computing (ISWC). Acceptance rate: 22.7%.
- [C35] Reuben Kirkham, Sebastian Mellor, David Green, Jiun-Shian Lin, Karim Ladha, Cassim Ladha, Daniel Jackson, Patrick Olivier, Peter Wright, Thomas Plötz (2013) *The Break-Time Barometer – An Exploratory System for Workplace Break-time Social Awareness*. In Proc. Int. Conf. Ubiquitous Comp. (UbiComp). Acceptance rate: 23%.
- [C36] Thomas Plötz, Nils Hammerla, Agata Rozga, Andrea Reavis, Nathan Call, Gregory D. Abowd (2012) *Automatic Assessment of Problem Behavior in Individuals with Developmental Disabilities*. In Proc. Int. Conf. Ubiquitous Computing (UbiComp). Acceptance rate: 23%. **Honorable Mention Award (Best Paper Candidate)**
- [C37] Thomas Plötz, Chen Chen, Nils Hammerla, Gregory D. Abowd (2012) *Automatic Synchronization of Wearable Sensors and Video-Cameras for Ground Truth Annotation – A Practical Approach*. In Proc. Int. Symp. Wearable Computing (ISWC). Acceptance rate: 27%.

- [C38] Andreas Moeller, Luis Roalter, Stefan Diewald, Matthias Kranz, Nils Hammerla, Patrick Olivier, Thomas Plötz (2012) *GymSkill: A Personal Trainer for Physical Exercises*. In Proc. Int. Conf. Pervasive Computing and Communications (PerCom). Acceptance rate: 18.7%
- [C39] Edison Thomaz, Vinay Bettadapura, Gabriel Reyes, Megha Sandesh, Grant Schindler, Thomas Plötz, Gregory D. Abowd, Irfan Essa (2012) *Recognizing Water-Based Activities in the Home Through Infrastructure-Mediated Sensing*. In Proc. Int. Conf. Ubiquitous Comp. (UbiComp). Acceptance rate: 27%.
- [C40] Clare Hooper, Anne Preston, Madeline Balaam, Paul Seedhouse, Cuong Pham, Daniel G. Jackson, Thomas Plötz, Patrick Olivier (2012) *The French Kitchen: Task-Based Learning in an Instrumented Kitchen*. In Proc. Int. Conf. Ubiquitous Comp. (UbiComp). Acceptance rate: 27%.
- [C41] Roisin McNaney, Stephen Lindsay, Karim Ladha, Cassim Ladha, Guy Schofield, Thomas Plötz, Nils Hammerla, Daniel Jackson, Richard Walker, Nick Miller, Patrick Olivier (2011) *Cueing Swallowing in Parkinson's Disease*. In Proc. ACM CHI Conference on Human Factors in Computing Systems. Acceptance rate: 27%.
- [C42] Thomas Plötz, Nils Hammerla, Patrick Olivier (2011) *Feature Learning for Activity Recognition in Ubiquitous Computing*. In Proc. Int. Joint Conf. on Art. Intelligence (IJCAI). Acceptance rate: 17%.
- [C43] Andreas Moeller, Johannes Scherr, Luis Roalter, Stefan Diewald, Matthias Kranz, Nils Hammerla, Thomas Plötz, Patrick Olivier (2011) *GymSkill: Mobile Exercise Skill Assessment to Support Personal Health and Fitness*. In Proc. Int. Conf. Pervasive Computing (Video).
- [C44] Paul Seedhouse, Saandia Ali, Daniel G. Jackson, Thomas Plötz, Patrick Olivier (2011) *Learning French in a Digital Kitchen*. In Proc. Int. Conf. Europ Assoc for Computer-Assisted Language Learning.
- [C45] Jürgen Wagner, Thomas Plötz, Aart van Halteren, Jetty Hoonhout, Paula Moynihan, Daniel Jackson, Cassim Ladha, Karim Ladha, Patrick Olivier (2011) *Towards a Pervasive Kitchen Infrastructure for Measuring Cooking Competence*. In Proc. Int. Conf. Pervasive Computing Technologies for Healthcare (PervasiveHealth). Acceptance rate: 38%.
- [C46] C. Pham, T. Plötz, P. Olivier (2010) *A Dynamic Time Warping Approach To Real-Time Activity Recognition for Food Preparation*. In First Int. Joint Conf. on Ambient Intelligence. Acceptance rate: 38%.
- [C47] C. Pham, T. Plötz, P. Olivier (2010) *Real-Time Activity Recognition for Food Preparation*. In IEEE International Conference on Computing and Communication Technologies.
- [C48] B. Schauerte, T. Plötz, G. Fink (2009) *A Multi-Modal Attention System for Smart Environments*. In Proc. Int. Conf. on Computer Vision Systems (ICVS). Acceptance rate: 46%.
- [C49] B. Schauerte, J. Richarz, T. Plötz, C. Thureau, G. Fink (2009) *Multi-Modal and Multi-Camera Attention in Smart Environments*, 261–268. In Proc. Int. Conf. Multimodal Interfaces. Acceptance rate: 35%.
- [C50] K. Lienemann, T. Plötz, G. Fink (2008) *Automatic Classification of NMR Spectra by Ensembles of Local Experts*, 790–800. In Structural, Syntactic, and Statistical Pattern Recognition (SS+SPR).
- [C51] B. Moeller, T. Plötz, G. Fink (2008) *Calibration-free Camera Hand-Over for Fast and Reliable Person Tracking in Multi-Camera Setup*. In Proc. Int. Conf. on Pattern Recognition (ICPR). Acceptance rate: 46%.
- [C52] T. Plötz, C. Thureau, G. Fink (2008) *Camera-based Whiteboard Reading: New Approaches to a Challenging Task*, 385–390. In Proc. Int. Conference on Frontiers in Handwriting Recognition (ICFHR). Acceptance rate: 39%.
- [C53] J. Richarz, T. Plötz, G. Fink (2008) *Real-time Detection and Interpretation of 3D Deictic Gestures for Interaction With an Intelligent Environment*. In Proc. Int. Conf. on Pattern Recognition (ICPR). Acceptance rate: 46%.
- [C54] K. Lienemann, T. Plötz, G. Fink (2008) *SVM Ensemble Classification of NMR Spectra Based on Different Configurations of Data Processing Techniques*. In Proc. Int. Conf. on Pattern Recognition (ICPR). Acceptance rate: 46%.
- [C55] C. Kleine-Cosack, T. Plötz, G. Fink (2008) *Towards a Human Centered Infrastructure for KNX*

- enabled Intelligent Environments*. In KNX Scientific Conference.
- [C56] T. Plötz, C. Kleine-Cosack, G. Fink (2008) *Towards Human Centered Ambient Intelligence*, 26—43. In Proc. European Conference on Ambient Intelligence (Aml). Acceptance rate: 45%.
- [C57] J. Richarz, T. Plötz, G. Fink (2007) *Detecting Hands in Video Images Using Scale Invariant Local Descriptors*, 259—264. In IASTED Int. Conf. on Visualization, Imaging and Image Processing.
- [C58] K. Lienemann, T. Plötz, G. Fink (2007) *On the Application of SVM-Ensembles based on Adapted Random Subspace Sampling for Automatic Classification of NMR Data*, 42—51. In Proc. Int. Conf. Multiple Classifier Systems (MCS). Acceptance rate: 61%.
- [C59] G. Fink, T. Plötz (2007) *On the Use of Context-Dependent Modelling Units for HMM-Based Offline Handwriting Recognition*, 729—733. In Proc. Int. Conf. on Document Analysis and Recognition (ICDAR). Acceptance rate: 66%.
- [C60] T. Plötz, G. Fink (2007) *Tutorial on Markov Models for Handwriting Recognition*. In Proc. Int. Conf. on Document Analysis and Recognition (ICDAR).
- [C61] T. Plötz, G. Fink, P. Husemann, S. Kanies, K. Lienemann, T. Marschall, M. Martin, L. Schillingmann, M. Steinrücken, H. Sudek (2006) *Automatic Detection of Song Changes in Music Mixes Using Stochastic Models*. In Proc. Int. Conf. on Pattern Recognition (ICPR). Acceptance rate: 38.8%.
- [C62] G. Fink, T. Plötz (2005) *On Appearance-Based Feature Extraction Methods for Writer-Independent Handwritten Text Recognition*, 1070—1074. In Proc. IEEE Int. Conf. on Document Analysis and Recognition (ICDAR). Acceptance rate: 59%.
- [C63] T. Plötz, G. Fink (2004) *Feature extraction for improved Profile HMM based biological sequence analysis*, 315—318. In Proc. Int. Conf. on Pattern Recognition (ICPR). Acceptance rate: 35.1%.
- [C64] T. Plötz, G. Fink (2002) *Robust Time-Synchronous Environmental Adaptation For Continuous Speech Recognition Systems*, 1409—1412. In Proc. Int. Conf. on Spoken Language Processing (ICSLP). Acceptance rate: 51%.

Refereed workshop contributions (24)

- [W1] Yuchao Ma, Andrew T Campbell, Diane J Cook, John Lach, Shwetak N Patel, Thomas Ploetz, Majid Sarrafzadeh, Donna Spruijt-Metz, Hassan Ghasemzadeh (2021) “Transfer Learning for Activity Recognition in Mobile Health” *Percom 2021 Workshop on Pervasive Health Technologies (PerHealth)*
- [W2] K. Vyas, R. Ma, B. Rezaei, S. Liu, M. Neubauer, T. Ploetz, R. Oberleitner, S. Ostadabbas (2019). “Recognition Of Atypical Behavior In Autism Diagnosis From Video Using Pose Estimation Over Time”, in Proc. IEEE 29th Int. Workshop on Machine Learning for Signal Processing (MLSP)
- [W3] S. Nabil, D. Kirk, and T. Ploetz (2016). “Future of Ubiquitous Home Interaction with OUI Interiors,” in Adjunct Proc. ACM CHI (Workshop on the Future of Human-Building Interactions).
- [W4] Tudor Miu, Paolo Missier, Daniel Roggen, Thomas Plötz (2014) *On Strategies for Budget-Based Online Annotation in Human Activity Recognition*, in Adjunct Proc. UbiComp— HASCA workshop
- [W5] Yachna Sharma, Thomas Plötz, Nils Hammerla, Sebastian Mellor, Roisin McNaney, Patrick Olivier, Sandeep Deshmukh, Andrew Mccaskie, Irfan Essa (2014) *Video Based Assessment of OSATS Using Sequential Motion Textures*, in Adjunct Proc. MICCAI – M2CAI workshop
- [W6] Reuben Kirkham, Aftab Khan, Sourav Bhattacharya, Nils Hammerla, Sebastian Mellor, Daniel Roggen, Thomas Plötz (2013) *Automatic Correction of Annotation Boundaries in Activity Datasets by Class Separation Maximization*. In Adjunct Proc. Int. Conf. Ubiquitous Comp. (UbiComp) – HASCA workshop.
- [W7] Tim Coughlan, Michael Brown, Sarah Martindale, Rob Comber, Thomas Plötz, Kerstin Leder Mackley, Val Mitchell, Sharon Baurley (2013) *Methods for studying technology in the home*. In Extended Abstracts of CHI.
- [W8] Edison Thomaz, Thomas Plötz, Irfan Essa, Gregory D. Abowd (2012) *Hydrostream: A Platform for Collecting, Annotating and Analyzing Water Pressure for Health Applications*. In Proc. Workshop on Personal Informatics in Practice: Improving Quality of Life Through Data (in conjunction with CHI 2012).

- [W9] Nils Hammerla, Thomas Plötz, Peter Andras, Patrick Olivier (2011) *Assessing Motor Performance with PCA*. In Proc. Int. Workshop on Frontiers in Activity Recognition using Pervasive Sensing (in conjunction with Pervasive 2011).
- [W10] Edison Thomaz, Thomas Plötz, Irfan Essa, Gregory D Abowd (2011) *Interactive Techniques for Labeling Activities Of Daily Living to Assist Machine Learning*. In Proc. Int. Workshop on Interactive Systems in Healthcare.
- [W11] Thomas Plötz, Cuong Pham, Patrick Olivier (2011) *Who is Cooking? Sensor-Based Actor Identification in the Kitchen*. In Proc. Int. Workshop on Frontiers in Activity Recognition using Pervasive Sensing (in conjunction with Pervasive 2011).
- [W12] Michael Schneider, Alexander Kröner, Peter Stephan, Thomas Plötz, Fahim Kawsar, Gerd Kortuem (2010) *Digital object memories in the internet of things workshop*, 527. In Proceedings of the 12th ACM international conference adjunct papers on Ubiquitous computing - UbiComp '10.
- [W13] T. Plötz (2010) *How to do good research in Activity Recognition?*. In Workshop on “How to do good research in Activity Recognition” (in conjunction with Pervasive 2010).
- [W14] N. Y. Hammerla, T. Plötz, S. Vajda, G. A. Fink (2010) *Towards Feature Learning for HMM-based Offline Handwriting Recognition*. In International Workshop on Frontiers of Arabic Handwriting Recognition.
- [W15] M. Hennecke, T. Plötz, G. Fink, J. Schmalenstroeer, R Haeb-Umbach (2009) *A Hierarchical Approach to Unsupervised Shape Calibration of Microphone Array Networks*, 257–260. In IEEE Workshop on Stat. Signal Proc.
- [W16] S. Vajda, T. Ramforth, T. Plötz, G. Fink (2009) *Camera-Based Analysis of Whiteboard Notes*, 42–49. In Int. Workshop on Camera-Based Document Analysis and Recognition.
- [W17] T. Plötz, G. Fink (2008) *On the use of Empirically Determined Impulse Responses for Improving Distant Talking Speech Recognition*, 156–159. In Joint Workshop on Hands-free Speech Communication and Microphone Arrays.
- [W18] T. Plötz, G. Fink (2007) *An Efficient Method for Making Un-Supervised Adaptation of HMM-based Speech Recognition Systems Robust Against Out-Of-Domain Data*. In Int. Workshop on Natural Language Processing and Cognitive Science.
- [W19] G. Fink, T. Plötz (2007) *ESMERALDA: A Development Environment for HMM-Based Pattern Recognition Systems*. In Open German/Russian Workshop on Pattern Recognition and Image Understanding.
- [W20] C. Kray, L. B. Larsen, P. Olivier, M. Biemans, A. van Bunningen, M. Fetter, T. Jay, V.-J. Khan, G. Leitner, I. Mulder, J. Mueller, T. Plötz, I. Lopez De Vallejo (2007) *Evaluating Ubiquitous Systems with Users*, 63–74. In Constructing Ambient Intelligence Aml 2007 Workshop Proc.
- [W21] J. Richarz, T. Plötz, G. Fink (2007) *Integration of Structural and Color Cues for Robust Hand Detection in Video Images*. In Open German/Russian Workshop on Pattern Recognition and Image Understanding.
- [W22] G. Fink, T. Plötz (2006) *Unsupervised Estimation of Writing Style Models for Improved Unconstrained Off-line Handwriting Recognition*, 429–434. In Proc. Int. Workshop on Frontiers in Handwriting Recognition (IWFHR).
- [W23] T. Plötz, G. Fink (2005) *A New Approach for HMM based Protein Sequence Modeling and its Application to Remote Homology Classification*. In Workshop Statistical Signal Processing.
- [W24] G. Fink, T. Plötz (2004) *Integrating Speaker Identification and Learning with Adaptive Speech Recognition*, 185–192. In A Speaker Odyssey – Speaker & Language Recogn. Workshop.

Other (7)

- [O1] B. Hu, Y. Gao, Y. Guan, Y. Long, N. Lane, T. Ploetz, “Robust cross-view gait identification with evidence: A discriminant gait gan (diggan) approach on 10,000 people”, *arXiv.org*, vol. cs.HC. 26-Nov-2018
- [O2] K. Nelavelli and T. Ploetz, “Adaptive App Design by Detecting Handedness,” *arXiv.org*, vol. cs.HC. 21-May-2018.
- [O3] M. Vanhoof, F. Reis, Z. Smoreda, and T. Ploetz, “Detecting home locations from CDR data: introducing spatial uncertainty to the state-of-the-art,” *arXiv.org*, vol. cs.CY. 20-Aug-2018.

- [O4] M. Vanhoof, T. Ploetz, and Z. Smoreda, "Geographical veracity of indicators derived from mobile phone data.," *arXiv.org*, vol. cs.CY. 2018.
- [O5] B. Hu, Y. Gao, Y. Guan, Y. Long, N. Lane, and T. Ploetz, "Robust Cross-View Gait Identification with Evidence - A Discriminant Gait GAN (DiGGAN) Approach on 10000 People.," *arXiv.org*, vol. cs.CV. 2018.
- [O6] T. Plötz (2001) *Online Adaptation of Statistical Speech Recognition Systems* (In German: Online Adaptation Statistischer Spracherkennungssysteme). Diploma Thesis (MSc equiv.), Faculty of Technology, Bielefeld University.
- [O7] T. Plötz (1998) *Calculation of capacities of electric circuits with regard to ground or power areas on printed circuit boards* (In German: Berechnung der Kapazitäten von elektrischen Signalnetzen zu einer Masse- / Powerfläche einer Leiterplatte). Diploma Thesis (MEng equiv.). University of Cooperative Education Mosbach.

Invited Talks & Seminars (selection)

- [T1] "Quo Vadis, [Computational] Behavior Analysis?," keynote at the IEEE ACII conference on Affective Computing and Intelligent Interaction, Cambridge, UK, September, 2019
- [T2] "Computational Behavior Analysis through Wearables and Machine Learning – Pushing the Boundaries towards usable Digital Health.," invited presentation, University of Cambridge (Center for Mobile, Wearable Systems and Augmented Intelligence), Cambridge, UK, February 2019
- [T3] "Computational Behavior Analysis through Wearables and Machine Learning – Pushing the Boundaries towards usable Digital Health.," invited presentation, University of Warwick, Warwick, UK, February 2019
- [T4] "Computational Behavior Analysis through Wearables and Machine Learning – Pushing the Boundaries towards usable Digital Health.," invited presentation, University of Oxford, Oxford, UK, February 2019
- [T5] "Computational Behavior Analysis through Wearables and Machine Learning – Pushing the Boundaries towards usable Digital Health.," invited presentation, University of Virginia, Charlottesville, USA, November 2018
- [T6] Tutorial "Deep Learning for Mobile and Ubiquitous Computing" held at UbiComp 2017, Maui, USA, September 2017
- [T7] "Machine Learning for Sensor Data Analysis in HCI: A foray into pitfalls of utilitarian use of machine learning, and ways to avoid them", GVU Brown Bag lecture, Georgia Institute of Technology, Atlanta, USA, November 2017.
- [T8] "Apply It! Machine Learning for Real World Applications / Real World Applications for Machine Learning – The Case of Digital Health.," invited presentation, University of Texas, Austin, USA, April 2017.
- [T9] "Automated Assessment of Problem Behavior in Individuals with Developmental Disabilities". NIH Biometrics Workshop, Bethesda, USA, March 2017.
- [T10] Tutorial "Deep Learning for Mobile and Ubiquitous Computing" held at MobiCase 2016, Cambridge, UK, November 2016
- [T11] "Sensing and Sense Making: Wearables, Ubiquitous Computing, and (Applied!) Machine Learning", invited course, Microsoft Summer School on the Internet of Things, Kazan, Russia, 2016.
- [T12] "Early Disease Detection in Pig Farms", invited presentation, School of Veterinary Science, Surrey University, Guildford, UK, April 2016.
- [T13] "Digital Health – Next Generation Health and Wellbeing Assessment & Support", invited presentation, Lancaster University, UK, January 2016.
- [T14] "Apply It! Machine Learning for Real World Applications / Real World Applications for Machine Learning", invited presentation, School of Interactive Computing, Georgia Institute of Technology, Atlanta, USA, January 2016
- [T15] Tutorial "Bridging the Gap – Machine Learning for Ubiquitous Computing" held at UbiComp

2015, Osaka, Japan

- [T16] “Ubiquitous Computing for Computational Behaviour Analysis in Health and Wellbeing”, *invited colloquium* “Perspectives of Ubiquitous Computing”, Siegen University, Siegen, Germany, January 2015
- [T17] “I know what you are doing, and I can tell how well! – An outlook beyond (traditional) Activity Recognition”, *invited SPHERE seminar*, Bristol University, Bristol, UK, November 2014
- [T18] “Computational Behaviour Analysis – Objective Assessment for Effective Assistance”, *invited seminar* at Federal University of Campinas (Samsung distinguished speakers seminar series), Campinas, Brazil, September 2014
- [T19] “Computational Behaviour Analysis – Objective Assessment for Effective Assistance”, *invited seminar* at Samsung Research Centre, (Samsung distinguished speakers seminar series), Campinas, Brazil, September 2014
- [T20] “Computational Behaviour Analysis – Objective Assessment for Effective Assistance”, *invited seminar* at Federal University of Manaus (Samsung distinguished speakers seminar series), Manaus, Brazil, September 2014
- [T21] “I know what you are doing, and I can tell how well! – An outlook beyond (traditional) Activity Recognition”, *invited keynote* at Workshop in Video Based Human Activity Recognition (WVHAR, in conjunction with SIBGRAPI 2014), Rio de Janeiro, Brazil, August 2014
- [T22] “Computational Behaviour Analysis – Objective Assessment for Effective Assistance”, *guest lecture*, Sheffield University, Sheffield, UK, January 2014.
- [T23] Dagstuhl seminar 12492 “Human Activity Recognition in Smart Environments”, Schloss Dagstuhl, December 2012
- [T24] *Guest lectures* “Accelerometry - Direct Sensing of Human Movements and Automatic Data Analysis” / “Hands on Accelerometry” / “Markov Models for Pattern Recognition”, Institute for Geoinformatics, University of Münster, Münster, Germany, November 2012
- [T25] “Activity recognition in real-world health scenarios”, *invited tutorial*, iCareNet summer school, Ambleside, UK, September 2012
- [T26] “Activity Recognition in Real-World Health Scenarios – A Practitioner’s Tutorial”, *invited tutorial*, workshop on Situation, Activity, and Goal awareness (SAGAWARE, in conjunction with Ubicomp 2012), Pittsburgh, September 2012
- [T27] “Accelerometry – Direct Sensing of Human Movements and Automatic Data Analysis”, *invited tutorial*, NSF expedition on computational behavior science summer school, Harris, N.Y., USA, June 2012
- [T28] “Sensor Data Analysis”, *guest lectures*, Georgia Institute of Technology, Atlanta, USA, November 2011
- [T29] “Digital inclusion”, Tsinghua University, Beijing, China, March 2010
- [T30] “Markov Models for Handwriting Recognition” and “Statistical Recognizers for Sequential Data – The ESMERALDA Framework”, *lecture tour (1 week)*, KFUPM, Dhahran, Saudi Arabia, April 2009 (invited by Prof. Dr. Mahmoud)
- [T31] “Automatic detection of song changes in music mixes using stochastic models” held at “Workshop perception oriented music classification”, Nokia Research Center, Bochum, Germany, 2008
- [T32] “Tutorial on Markov models for handwriting recognition” held at Int. Conf. on Document Analysis and Recognition, Curitiba, Brazil, 2007
- [T33] “Integration of structural and color cues for robust hand detection in video images.” held at 7th Open German/Russian Workshop on Pattern Recognition and Image Understanding, Ettlingen, Germany, 2007
- [T34] “An efficient method for making un-supervised adaptation of HMM-based speech recognition systems robust against out-of-domain data” held at 4th Int. Workshop on Natural Language Processing and Cognitive Science, Funchal, Madeira, 2007
- [T35] “Enhanced Probabilistic Models for Remote Homology Detection” held at Max Planck Institute for Computer Science, Saarbrücken, Germany, 2004
- [T36] “GRASSP – Genetic Relationships Analysis based on Statistical Sequence Profiles” held at

Bioinformatics Centre, University of Copenhagen, Denmark, 2004
[T37] “Increasing the Power of Profile HMMs by Incorporating Scoring Schemes” – *guest lecture*, Bioinformatics Centre, University of Copenhagen, Denmark, 2004

Other Relevant Information

Media Coverage

- *FINCA – Smart Environment* (at TU Dortmund University): local newspapers (Westfaelische Rundschau, Ruhr Nachrichten), local radio broadcaster (WDR2, WDR 1Live, eldorado), local news broadcaster science website (WDR) – 2007
- *Language Learning in the Kitchen & Ambient Kitchen*: New Scientist Magazine – 2012
- *ClimbAX – Skill Assessment for Climber*: New Scientist Magazine, CNN, NBC, numerous climbing magazines – 2013
- *DogTag – Activity Recognition for Dogs*: New Scientist Magazine, Daily Mail, BBC, etc. – 2013

Service & Community

Journal Editorships

Proc. of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT)

- Editor 2019 –
- (founding) Associate Editor 2016 – 2019

Frontiers in Mobile and Ubiquitous Computing

- Associate Editor 2020 –

Guest Editorships

Interacting with Computers

Special Issue on Studying Technology in the Home, 2014

Program Committee Membership

• ACM SIGKDD Conference on Knowledge Discovery and Data Mining (SIGKDD 2021) • Int. Joint Conf. Artificial Intelligence (IJCAI – Senior PC: 2021, 2020, 2019; 2018) • ACM Int. Joint Conf. on Pervasive and Ubiquitous Comp. (UbiComp 2016, 2015, 2014, 2013) • Int. Symposium on Wearable Computing (ISWC 2020 [chair], 2019, 2018, 2017 [chair], 2016, 2015) • Int. Conf. on Pervasive Computing and Communication (Percom 2017, 2016, 2015) • Int. Conf. Pervasive Computing Technologies for Healthcare (PervasiveHealth 2016, 2015) • Int. Conf. on Mobile Computing, Applications and Services (MobiCASE 2014) • Int. Conf. on Ubiquitous Computing & Ambient Intelligence / Int. Workconference on Ambient Assisted Living (UCAml / IWAAL 2014) • Int. Conf. on Mobile and Ubiquitous Systems: Computing, Networking and Services (MobiQuitous 2014) • Int. Conf. on Mobile and Ubiquitous Multimedia (MUM 2013) • Int. Conf. of Networked Sensing Systems (INSS 2012) • IEEE World Congress on Comp. Intelligence (WCCI 2012) • Int. Conf. on Intelligent Environments (IE 2012) • ACM Int. Conf. on Designing Interactive Systems (DIS 2012, Area Chair “Technology”) • Int. Conf. on Machine Learning and Applications (ICMLA 2011) • Int. Joint Conf. on Art. Intell. (IJCAI 2011) • Int. Conf. on Pattern Rec. Appl. and Methods (ICPRAM 2012) • Int. Conf. on Pervasive Computing and Applications (ICPCA 2011) • Int. Workshop on Situation, Activity and Goal Awareness (SAGAware2011, in conjunction with UbiComp 2011) • Int. Workshop on Networking and Object Memories for the Internet of Things (NOME-IoT 2011, in conjunction with UbiComp 2011) • Int. Workshop on Designing and Integrating Independent Living Technology (DILT 2011, in conjunction with Pervasive Health 2011) • Int. Workshop on Frontiers in Activity Recognition using Pervasive Sensing (IWFAR 2011, in conjunction with Pervasive 2011) • Int. Workshop on Pervasive Urban Applications (PURBA 2011, in conjunction with Pervasive 2011) • Int. Workshop on Machine Learning for Assistive Technologies (MLAT 2010, in conjunction with Neural Information Processing Systems Conference – NIPS 2010) • Int. Workshop on Digital Object Memories

in the Internet of Things (DOME-IoT 2010, in conjunction with Ubicomp 2010) • Int. Workshop on Frontiers in Arabic Handwriting Recognition (FAHR 2010, at ICPR 2010)

Conference & Workshop Organization

- Chair (joint) 6th Percom Workshop on Pervasive Health Technologies (PerHealth 2021)
- Member of Steering Committee Int. Symp. On Wearable Computing (ISWC); 2017 –
- Member of Steering Committee Int. Joint Conf. Pervasive and Ubiquitous Computing (UbiComp); 2019 –
- Chair TPC (joint), Int. Symp. on Wearable Computing (ISWC 2020)
- Chair TPC (joint), Int. Symp. on Wearable Computing (ISWC 2017)
- Chair (joint), HomeSys 2014 (Workshop in conjunction with ACM UbiComp 2014)
- Workshop Organization Chair (joint), Int. Conf. Pervasive Computing (Pervasive 2012)
- Local Organization Chair, Int. Conf. Pervasive Computing (Pervasive 2012)
- Workshop Organization Chair (joint), Int. ICST Conf. on Pervasive Computing Technologies for Healthcare (PervasiveHealth 2012)
- Chair (joint), Int. Workshop on Methods for Studying Technology in the Home (in conjunction with ACM CHI 2013)
- Chair (joint), Int. Workshop on Context Systems, Design, Evaluation and Optimisation (CoSDEO 2011, in conjunction with MobiQuitous 2011)
- Chair(joint) Int. Workshop on Networking and Object Memories for the Internet of Things (NOME-IoT 2011, in conjunction with Ubicomp 2011)
- Chair (joint), Int. Workshop on Frontiers in Activity Recognition using Pervasive Sensing (IWFAR 2011, in conjunction with Pervasive 2011)
- Chair(joint), Int. Workshop on Machine Learning for Assistive Technologies (MLAT2010, in conjunction with Neural Information Processing Systems Conference, NIPS 2010)
- Chair (joint), Int. Workshop on Digital Object Memories in the Internet of Things (DOME-IoT 2010, in conjunction with Ubicomp 2010)
- Chair (joint), Int. Workshop on Frontiers in Arabic Handwriting Recognition (FAHR 2010, in conjunction with ICPR 2010)

Scientific Reviewing

Funding Organizations

- Independent Research Fund Denmark (2019 –)
- Research Council of Ghent University (Belgium)
- Engineering and Physical Sciences Research Council (EPSRC UK)
 - Member of the EPSRC Peer Review College (2016 –)
- Leverhulme Trust
- Alzheimer Association of America
- European Research Council (FP 7)

Journals, Conferences, Workshops

• PACM IMWUT • Foundations and Trends in Human Computer Interaction • IEEE Trans. Human-Machine Systems • Int. Conf. on Mobile and Ubiquitous Systems: Computing, Networking and Services (MobiQuitous 2014) • Int. Conf. on Mobile Computing, Applications and Services (MobiCASE 2014) • Int. Conf. on Ubiquitous Computing & Ambient Intelligence / Int. Workconference on Ambient Assisted Living (UCAml / IWAAL 2014) • Int. Conf. on Pervasive Computing Technologies for Healthcare (PervasiveHealth 2014) • Int. Journal of Pervasive and Mobile Computing (PMC) • ACM Trans. on Interactive Intell. Systems • ACM CHI Conference on Human Factors in Computing Systems (2015, 2014, 2013) • ACM Int. Conf. on Mobile and Ubiquitous Multimedia (MUM 2013) • Int. Journal of User Modeling and User Adapted Interaction • IEEE Journal on Biomedical and Health Informatics • Journal of Machine Vision and Applications • Int. Journal of Ambient Intelligence and Smart Environments (JAISE) • Int. Conf. of Networked Sensing Systems (INSS 2012) • IEEE Trans. on Autonomous and Adaptive Systems

(TAAS) • ACM Int. Conf. on Designing Interactive Systems (DIS 2012) • 5th IEEE Int. Symposium on Wearable Computers (ISWC 2011) • BCS Conference on Human Computer Interaction (HCI 2011, 2012) • IEEE Trans. on Pattern Analysis and Machine Intelligence (TPAMI) • Elsevier Pattern Recognition Letters Journal • IEEE Trans. on Systems, Man, and Cybernetics (SMC) • IEEE / ACM Trans. on Computational Biology and Bioinformatics • Journal on Statistical Applications in Genetics and Molecular Biology (SAGMB) • Journal on Algorithms for Molecular Biology (AL-MOB) • ACM International Conference on Ubiquitous Computing (Ubicomp; 2010, 2011, 2012, 2013, 2014, 2015, 2016) • Int. Conf. on Pervasive Computing (Pervasive; 2010, 2011, 2012) • Int. Conf. on Intelligent Environments (IE; 2011, 2012) • 1st Int. Workshop on Frontiers in Arabic Handwriting Recognition (FAHR 2010, in conjunction with ICPR 2010) • Int. Workshop on Digital Object Memories in the Internet of Things (DOME-IoT 2010, in conjunction with Ubicomp 2010) • IEEE/ACM Int. Conf. on Multimodal Interfaces and Workshop on Machine Learning for Multi-modal Interaction (ICMI 2009, 2012) • 31st Pattern Rec. Symp. of the German Ass. for Pattern Rec. (DAGM) 2009 • Int. Conf. on Frontiers in Handwriting Recognition (ICFHR) 2008 • IEEE/RSJ Int. Conf. on Intelligent Robots and Systems (IROS) 2006 • Int. Workshop on Frontiers in Handwriting Recognition 2006 • 15th IEEE Int. Symp. on Robot and Human Interactive Communication (ROMAN) 2006

Consulting & Advisory

- UK Biobank Activity Expert Working Group (2014 –)
Advised on and contributed to collection of large scale accelerometry dataset (100,000 participants), and on data analysis.
- Behavior Imaging Inc. (2018 – 2019)
Consulting on deep learning based assessment of home videos for identification of behavioral markers that may be indicative for Autism.
- SalesTing Inc. (2018 –)
Consulting on automated video summarization.

Internal Service at Academic Institutions

Georgia Institute of Technology (2017 –)

- Member of Retention, Promotion, and Tenure sub-committees
- HCI Area Lead
- Thread Lead: People
- Faculty member of MS HCI program

Newcastle University, School of Computing Science (2009 – 2017)

- Internal examiner PhD examinations (Dr Tom Barindale, Dr David Kim, Dr James Fisher)
- Member of Management Team Open Lab (formerly: Digital Interaction at Culture Lab)
- Member of Module Moderation Board (since 2012)
- Member of Board of Studies (since 2012)
- Interviewer for Admission Process (since 2012)
- Member of PhD progression panel (since 2014)
- Director of Postgraduate Studies (since July 2016)
- Member of Research Committee (since July 2016)
- Member of Executive Committee (since July 2016)
- Member of Learning and Teaching Committee (since July 2016)

TU Dortmund University, Department of Computer Science (2006 – 2009)

- Member of Teaching and Planning committee
 - Founding member of sub-committee for restructuring teaching allocation
- Member of search committee for appointment of successor for Prof Ingo Wegener

Patents

- Piyush Saggi, Nitesh Chhajwani, Thomas Ploetz “Content summarization leveraging systems and processes for key moment identification and extraction”, PCT/US20200372066A1, pending (May 22, 2020)
- Cheng Zhang, Gregory D. Abowd, Omer Inan, Pranav Kundra, Thomas Ploetz, Yiming Pu, Thad Starner, Anandghan Waghmare, Xiaxuan Wang, Kenneth Cunefare, Qiuyue Xue, “*Systems, Methods and Devices for Gesture Recognition*”, PCT/US2018/049740, pending (March 14, 2019)

Awards & Honors

- Best Paper Award for paper “*Sensing Affect to Empower Students: Learner Perspectives on Affect-Sensitive Technology in Large Educational Contexts*”, Seventh ACM Conference on Learning@ Scale, 2020.
- “Thank a Teacher” note for CS6601, Georgia Institute of Technology, 2020 (6x).
- “Thank a Teacher” note for CS4605, Georgia Institute of Technology, 2020 (2x).
- “Thank a Teacher” note for CS6601, Georgia Institute of Technology, 2019.
- “Thank a Teacher” note for CS4605, Georgia Institute of Technology, 2019.
- Level 2 Distinguished PC member, IJCAI 2018
- “Thank a Teacher Award” for CS4605, Georgia Institute of Technology, 2018.
- Honorable mention award (top 5%) for paper “Beyond Activity Recognition: Skill Assessment from Accelerometer Data”, Ubicomp 2015.
- Honorable mention (best paper candidate) for paper “Video Based Assessment of OSATS Using Sequential Motion Textures”, M2CAI 2014
- Associate Fellow of the Higher Education Academy (AFHEA, UK), 2014
- European Label for innovative projects in language teaching and learning (for the “French Kitchen” project; awarded by the European Commission), 2012
- Honorable mention (best paper candidate) for paper “Automatic Assessment of Problem Behaviour in Developmental Disabilities”, Ubicomp 2012
- Travel grant Int. Joint Conf. Artificial Intelligence (IJCAI, 2011)