



Curriculum Vitae Prof. Dr. Michael J. Black



Image: Wolfgang Scheible

Name: Michael J. Black

Research Priorities: Computer vision, human motion, virtual avatars, computer graphics, machine learning

Michael Black is an American computer scientist specialising in motion estimation from videos, with a particular focus on 3D human motion. He combines computer vision, computer graphics and machine learning to teach machines to see and understand humans and their behaviour. His methods are widely used in industry as well as in social sciences, psychology and healthcare.

Academic and Professional Career

- since 2022 Deputy Managing Director, Max Planck Institute for Intelligent Systems, Tübingen, Germany
- 2018 - 2019 Acting Director, Autonomous Motion Department, Max Planck Institute for Intelligent Systems, Tübingen, Germany
- 2018 Managing Director, Max Planck Institute for Intelligent Systems, Tübingen, Germany
- 2017 - 2021 Distinguished Amazon Scholar
- 2015 Co-Director, Max Planck ETH Center for Learning Systems, Max Planck Gesellschaft Munich, Germany and ETH Zurich, Zurich, Switzerland
- 2014 - 2016 Visiting Professor, Department of Information Technology and Electrical Engineering, Swiss Federal Institute of Technology Zurich (ETH), Zurich, Switzerland
- 2013 - 2017 Co-Founder, Scientific Advisor and Member of the Board, Body Labs Inc., New York City, USA
- 2013 - 2015 Managing Director, Max Planck Institute for Intelligent Systems, Tübingen, Germany

since 2012 Honorary Professor, University of Tübingen, Tübingen, Germany

since 2011 Founding Director, Max Planck Institute for Intelligent Systems, Stuttgart/Tübingen, Germany

2011 - 2020 Adjunct Professor, Department of Computer Science, Brown University, Providence, USA

2011 - 2013 Visiting Professor, Stanford University, Stanford, USA

2008 - 2009 Director of Graduate Studies, Department of Computer Science, Brown University, Providence, USA

2004 - 2010 Professor, Department of Computer Science, Brown University, Providence, USA

2000 - 2004 Associate Professor, Department of Computer Science, Brown University, Providence, USA

1998 - 1999 Visiting Scientist, Royal Institute of Technology, Stockholm, Sweden

1996 - 2000 Area Manager, Xerox Palo Alto Research Center (PARC), Palo Alto, USA

1993 - 1995 Member, Research Staff, Xerox Palo Alto Research Center (PARC), Palo Alto, USA

1992 - 1993 Assistant Professor, University of Toronto, Toronto, Canada

1992 PhD, Computer Science, Yale University, New Haven, USA

1990 - 1992 Visiting Researcher, Aerospace Human Factors Research Division, NASA Ames Research Center, Mountain View, USA

1989 MSc, Computer Science, Stanford University, Stanford, USA

1985 BSc, Honours Computer Science, University of British Columbia, Vancouver, Canada

Functions in Scientific Societies and Committees

2021 Member, Selection Committee, Max Planck-Humboldt Research Award

since 2017 Spokesperson and Member, Executive Board, Cyber Valley, Tübingen, Germany

since 2017 Executive Board, International Max Planck Research School (IMPRS) for Intelligent Systems, Max Planck Society, Munich, Germany

2009 - 2010 Member, The President's Science Council, Brown University, Providence, USA

2002 - 2010 Executive Committee Member, Brown Institute for Brain Science (formerly: Brain Science Program), Providence, USA

2010 Director, Industrial Partners Program, Department of Computer Science, Brown University, Providence, USA

Project Coordination, Membership in Collaborative Research Projects

- 2017 Cluster of Excellence “Machine Learning: New Perspectives for Science”, German Research Foundation (DFG)
- since 2016 Deputy Spokesperson, “Robust Vision – Inference Principles and Neural Mechanisms”, Collaborative Research Centre SFB1233, DFG
- 2010 - 2013 Co-Principal Investigator, “Bodies from scans: Analysis of rigid and non-rigid motion”, Office of Naval Research, Ballston, USA
- 2009 - 2013 Co-Principal Investigator, “Towards an animal model of freely moving humans”, National Institutes of Health (NIH), Bethesda, USA
- 2009 - 2011 Co-Principal Investigator, “Collaborative Research: Neural and computational models of spatio-temporally varying natural scenes”, Collaborative Research in Computational Neuroscience (CRCNS), National Science Foundation (NSF), Alexandria, USA
- 2008 - 2011 Principal Investigator, “RI-Small: Human shape and pose from images”, NSF, Alexandria, USA
- 2006 Co-Principal Investigator, “Neural interfaces to enhance human motor performance: Instrumentation for modeling dexterous manipulation”, Defense University Research Instrumentation Program, Office of Naval Research, Ballston, USA
- 2005 - 2008 Project “Statistical Models of the Primate Neocortex: Implementation and Application”, NSF, Alexandria, USA
- 2005 - 2008 Principal Investigator, “Learning Rich Statistical Models of the Visual World for Robust Perception”, NSF, Alexandria, USA
- 2004 - 2007 Co-Principal Investigator, “CRCNS: Learning the Neural Code for Prosthetic Control”, NIH, Bethesda, USA
- 2004 - 2006 Project “Neural Interfaces to Understand Human Motor Performance”, Office of Naval Research, Ballston, USA
- 2004 - 2008 Project “Neurobotics – The Fusion of Neuroscience and Robotics”, Beyond Robotics Program, European Union (EU)
- 2002 - 2007 Co-Principal Investigator, “Static and Dynamic Organization of Primate Cortex”, NIH, Bethesda, USA
- 2002 - 2005 Co-Principal Investigator, “Cortical Control of Neural Prostheses”, NIH, Bethesda, USA
- 2001 - 2005 Co-Principal Investigator, “The Computer Science of Biologically Embedded Systems”, NSF, Alexandria, USA
- 2001 - 2004 Project “Motion Capture for Statistical Learning of Human Appearance and Motion”, Office of Naval Research, Ballston, USA

Honours and Awarded Memberships

2021	Member, German National Academy of Sciences Leopoldina, Germany
2020	Longuet-Higgins Prize, Computer Society Technical Community on Pattern Analysis and Machine Intelligence (TCPAMI), Institute of Electrical and Electronics Engineers IEEE
2018	Alumni Research Award, Department of Computer Science, University of British Columbia, Vancouver, Canada
2018	Amazon Research Award, Amazon.com Inc., Seattle, USA
since 2015	Foreign Member, Royal Swedish Academy of Sciences, Sweden
2013	Helmholtz Prize, International Conference on Computer Vision, Institute of Electrical and Electronics Engineers, USA
2010	Koenderink Prize, European Conference on Computer Vision

Research Priorities

Michael Black is an American computer scientist specialising in motion estimation from video, with a particular focus on 3D human motion. He combines computer vision, computer graphics and machine learning to teach computers to see and understand humans and their behaviour. His methods are widely used in industry as well as in social sciences, psychology and healthcare.

Humans use their bodies, facial expressions and gestures to help shape the world. In order for computers to act as fully fledged partners to humans, they must be able to see and understand people's behaviour and recognise their facial expressions, motions and actions.

Although computers can already "see", their powers of perception are not as strong or flexible as human perception. Certain things that humans can easily see and understand still pose a challenge to machines. For example, if computers are to fully comprehend humans and their behaviour, they need to be able to recognise situations when a person wishes to pick up something heavy and needs help to do so. They must also be able to perceive when a person is distracted or when changes in their behaviour may suggest medical problems or cognitive decline.

To overcome such challenges, Michael Black's team uses machine learning to train computers so that they can reproduce human behaviour, motions and facial expressions in great detail and in a 3D world. Black develops robust algorithms and 3D models of the human body on a level never achieved before. He takes individual images and videos and uses them to recreate three-dimensional human figures, their movements and the objects around them. These technologies have numerous potential uses, especially in the area of human health. For instance, Black has found a way of capturing the 3D movements of infants so that cerebral

palsy can be automatically diagnosed at an early stage when intervention may still be beneficial. He also uses statistical 3D body shape models and virtual reality to conduct research into the causes of eating disorders.