RNDr. Michal Balážia, Ph.D.

Personal

Nationality: Slovakia
Birthday: 09/Aug/1988
Marital status: single

Contact

Address: Nice, France
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Profession

Position: Permanent researcher in artificial intelligence
Interests: Psychiatric disorders, human gait recognition, surveillance event detection
Web: http://www-sop.inria.fr/members/Michal.Balazia/

Academic Profiles

Google Scholar: https://scholar.google.com/citations?user=idIT1iYAAAAJ
ResearchGate: https://www.researchgate.net/profile/Michal_Balazia
LinkedIn: https://www.linkedin.com/in/michal-balazia-07760ba5
ORCID: https://orcid.org/0000-0001-7153-9984
arXiv: http://arxiv.org/a/balazia_m_1

Education

Masaryk University, Faculty of Informatics
Brno, Czech Republic

Doctoral Degree (RNDr., Ph.D.) **Feb/2013 – Apr/2018**

- Program: Computer Science
- Specialization: human gait recognition, biometrics, pattern recognition, machine learning
- Thesis: *Gait Recognition from Motion Capture Data*, reviewed by Arun Ross
- Advisers: Pavel Zezula, Jan Sedmidubský, Konstantinos N. Plataniotis, Petr Sojka

Master's Degree (Mgr.) **Sep/2010 – Feb/2013**

- Program: Information Technology Security
- Specialization: cryptography, biometric technologies, similarity search
- Thesis: *Human Gait Recognition Based on Body Component Trajectories*
- Advisers: Jan Sedmidubský, Pavel Zezula

Bachelor's Degree (Bc.) **Sep/2007 – Jun/2010**

- Program: Mathematical Informatics
- Specialization: discrete mathematics, similarity search
- Thesis: *Random Number Generation for Similarity Search*
- Advisers: David Novák, Pavel Zezula

Overseas Studies and Internships

University of Toronto, The Edward S. Rogers Sr. Department of Electrical & Computer Engineering
Toronto, Canada

- **International Visiting Graduate Student Research** **Sep/2014 – Aug/2015**
  Scientific research on structure-based human gait recognition and signal processing

Eindhoven University of Technology, Department of Mathematics and Computer Science
Eindhoven, Netherlands

- **Lifelong Learning Programme Erasmus** **Feb/2012 – Aug/2012**
  Industrial and Applied Mathematics

Professional Experience

INRIA Sophia Antipolis - Méditerranée, STARS Research Team
Sophia Antipolis, France

- **Postdoctoral Researcher** **Sep/2019 – present**
  Topic: Automated Face and Gesture Analysis for Digital Health Monitoring
  Awarded one Joseph Fourier scholarship and two postdoctoral grants of Université Côte d'Azur
  Advisers: Antitza Dantcheva, François Brémond

University of South Florida, Department of Computer Science and Engineering
Tampa, USA

- **Postdoctoral Research Scholar** **May/2018 – May/2019**
  Topic: Surveillance Event Detection in Extended Video
  Member of the USF Bulls team placed 6th of 27 teams at the 2018 TRECVID ActEV Challenge
  Adviser: Sudeep Sarkar

Masaryk University, Faculty of Informatics
Brno, Czech Republic

- **Researcher** **Oct/2009 – Apr/2018**
  Sub-sequence matching, motion segmentation, gait recognition, machine learning
- **Teaching Assistant** **Feb/2016 – Jun/2017**
  Introduction to Information Retrieval
- **Teaching Assistant** **Sep/2010 – Dec/2015**
  Coding, Cryptography and Cryptographic Protocols

Gemmy, s.r.o.
Prešov, Slovakia

- **Webmaster** **Sep/2007 – Apr/2018**
  Design and maintenance of the company web page using PHP/HTML/CSS/XML

Extra-curricular

Erasmus Student Network at Masaryk University
Brno, Czech Republic

- **Active team member and Buddy – volunteering** **Feb/2010 – Apr/2018**
  Tutoring exchange students, organizing presentations, trips, games and sports

14th IEEE/IAPR/Eurasip International Summer School for Advanced Studies on Biometrics for Secure Authentication: Biometrics for Personalization and Forensic Identification
Alghero, Italy

- **Summer school – participation** **Jun/2017**
  Presenting research *MoCap-Assisted Walker Re-Identification*

CERES, Munk School of Global Affairs, University of Toronto
Toronto, Canada

- **Work&Study Program – internship** **Sep/2014 – Feb/2015**
  Library research

Board of European Students of Technology at University of Messina
Messina, Italy

- **Summer course – participation** **Aug/2013 – Sep/2013**
  Studying communication systems and wireless networks

Swedish Institute
Stockholm, Sweden

- **Swedish Innovation Prize – study visit** **Apr/2013**
  Studying security technologies of SAAB and FLIR Systems

Board of European Students of Technology at Eindhoven University of Technology
Eindhoven, Netherlands

- **Team member and Fundraiser executive – volunteering** **Feb/2012 – Aug/2012**
  Organizing a summer course for students of technology

AIESEC University of Oslo
Oslo, Norway

- **Culture Experience Programme – internship** **Jun/2011 – Aug/2011**
  Organizing a summer camp for asylum seekers in Bærum Kommune

Conference Publications

[C1] Muller P., Balazia M., Baur T., Dietz M., Heimerl A., Schiller D., Guermal M., Thomas D., Bremond F., Alexandersson J., Andre E., Bulling A.: **MultiMediate '23: Engagement Estimation and Bodily Behaviour Recognition in Social Interactions**. ACM Multimedia (ACMMM), pp 9640–9645, Ottawa, Canada, October 2023.

[C2] Agrawal T., Balazia M., Muller P., Bremond F.: **Multimodal Vision Transformers with Forced Attention for Behavior Analysis**. IEEE/CVF Winter Conference on Applications of Computer Vision (WACV), IEEE, pp 3392–3402, Waikoloa, USA, January 2023.

[C3] Balazia M., Muller P., Tanczos A.L., Liechtenstein A., Bremond F.: **Bodily Behaviors in Social Interaction: Novel Annotations and State-of-the-Art Evaluation**. ACM International Conference on Multimedia (ACMMM), ACM, pp 70–79, Lisbon, Portugal, October 2022.

[C4] Balazia M., Hlavackova-Schindler K., Sojka P., Plant C.: **Interpretable Gait Recognition by Granger Causality**. IEEE/IAPR International Conference on Pattern Recognition (ICPR), IEEE, pp 1069–1075, Montreal, Canada, August 2022.

[C5] Agrawal T., Agarwal D., Balazia M., Sinha N., Bremond F.: **Multimodal Personality Recognition using Cross-Attention Transformer and Behaviour Encoding**. IAPR International Conference on Vision Theory and Applications (VISAPP), SciTePress, pp 501–508, virtual, February 2022.

[C6] Sinha N., Balazia M., Bremond F.: **FLAME: Facial Landmark Heatmap Activated Multimodal Gaze Estimation**. IEEE International Conference on Advanced Video and Signal Based Surveillance (AVSS), IEEE, pp 1–8, virtual, November 2021.

[C7] Balazia M., Happy S.L., Bremond F., Dantcheva A.: **How Unique Is a Face: An Investigative Study**. IEEE/IAPR International Conference on Pattern Recognition (ICPR), IEEE, pp 7066–7071, Milan, Italy, January 2021.

[C8] Balazia M., Sarkar S.: **Repurposing Evaluation in Extended Videos to Active Object Tracking**. New In Machine Learning Workshop (NewInML) at Conference on Neural Information Processing Systems (NeurIPS), Vancouver, Canada, December 2019.

[C9] Aakur S., Sawyer D., Balazia M., Sarkar S.: **An Examination of Proposal-Based Approaches to Fine-Grained Activity Detection in Untrimmed Surveillance Videos**. NIST Workshop on TREC Video Retrieval Evaluation (TRECVID), Activity in Extended Video Challenge, Gaithersburg, USA, November 2018.

[C10] Balazia M., Sojka P.: **You Are How You Walk: Uncooperative MoCap Gait Identification for Video Surveillance with Incomplete and Noisy Data**. IEEE/IAPR International Joint Conference on Biometrics (IJCB), IEEE, pp 208–215, Denver, USA, October 2017.

[C11] Balazia M., Sojka P.: **An Evaluation Framework and Database for MoCap-Based Gait Recognition Methods**. IAPR Workshop on Reproducible Research in Pattern Recognition (RRPR), Springer, LNCS 10214, pp 33–47, Cancun, Mexico, December 2016.

[C12] Balazia M., Sojka P.: **Learning Robust Features for Gait Recognition by Maximum Margin Criterion (Extended Abstract)**. IAPR International Workshops on Structural and Syntactic Pattern Recognition (SSPR) and Statistical Techniques in Pattern Recognition (SPR), Springer, LNCS 10029, pp 585–586, Merida, Mexico, November 2016.

[C13] Balazia M., Sojka P.: **Walker-Independent Features for Gait Recognition from Motion Capture Data**. IAPR International Workshops on Structural and Syntactic Pattern Recognition (SSPR) and Statistical Techniques in Pattern Recognition (SPR), Springer, LNCS 10029, pp 310–321, Merida, Mexico, November 2016.

[C14] Balazia M., Sojka P.: **Learning Robust Features for Gait Recognition by Maximum Margin Criterion**. IEEE/IAPR International Conference on Pattern Recognition (ICPR), IEEE, pp 901–906, Cancun, Mexico, December 2016.

[C15] Balazia M., Sedmidubsky J., Zezula P.: **Semantically Consistent Human Motion Segmentation**. International Conference on Database and Expert Systems Applications (DEXA), Springer, LNCS 8644, pp 423–437, Munich, Germany, September 2014.

[C16] Sedmidubsky J., Valcik J., Balazia M., Zezula P.: **Gait Recognition Based on Normalized Walk Cycles**. International Symposium on Visual Computing (ISVC), Springer, LNCS 7432, pp 11–20, Rethymno, Greece, July 2012.

[C17] Valcik J., Sedmidubsky J., Balazia M., Zezula P., **Identifying Walk Cycles for Human Recognition**. Pacific Asia Workshop on Intelligence and Security Informatics (PAISI), Springer, LNCS 7299, pp 127–135, Kuala Lumpur, Malaysia, May 2012.

Journal Publications

[J1] Konig A., Muller P., Troger J., Lindsay H., Alexandersson J., Hinze J., Riemenschneider M., Postin D., Ettore E., Lecomte A., Musiol M., Amblard M., Bremond F., Balazia M., Hurlemann R.: **Multimodal Phenotyping of Psychiatric Disorders from Social Interaction: Protocol of a Clinical Multicenter Prospective Study**. Personalized Medicine in Psychiatry, Elsevier, volume 33-34, 100094, Amsterdam, Netherlands, May 2022.

[J2] Balazia M., Sojka P.: **Gait Recognition from Motion Capture Data**. ACM Transactions on Multimedia Computing, Communications and Applications (TOMM), special issue on Representation, Analysis and Recognition of 3D Humans, ACM, volume 14(1s), pp 22:1–22:18, New York, USA, February 2018.

[J3] Balazia M., Plataniotis K.N.: **Human Gait Recognition from Motion Capture Data in Signature Poses**. IET Biometrics, IET, volume 6(2), pp 129–137, London, United Kingdom, March 2017. 2018 IET Premium Award for Best Paper.

Grand Challenges

[G1] Muller P., Bulling A., Thomas D., Andre E., Baur T., Dietz M., Schiller D., Heimerl A., Balazia M., Bremond F.: **MultiMediate: Multi-modal Group Behaviour Analysis for Artificial Mediation**. Grand Challenge of ACM International Conference on Multimedia (ACMMM), ACM, Ottawa, Canada, October 2023.

Awards and Grants

UCA IDEX$^{\text{JEDI}}$ Fellowship for Young Researchers **Jun/2021**
Awarded by: Université Côte d'Azur, Initiative of Excellence
Project: *Automated Face and Gesture Analysis for Digital Health Monitoring*

UCA IDEX$^{\text{JEDI}}$ Thematic Postdoctoral Grant **Jun/2019**
Awarded by: Université Côte d'Azur, Initiative of Excellence
Project: *Deep Neural Networks: Assisted Face Analysis for Health Monitoring*

Rector's Award for an Outstanding Doctoral Thesis **May/2019**
Awarded by: Masaryk University
Project: *Gait Recognition from Motion Capture Data*

Joseph Fourier Prize – 1st place **Jun/2018**
Awarded by: French Institute in Prague, Atos
Project: *Gait Recognition from Motion Capture Data*

IET Biometrics Premium Award **Jun/2018**
Awarded by: Institution of Engineering and Technology
Paper: *Human Gait Recognition from Motion Capture Data in Signature Poses*

Diploma Thesis Award – 2nd place in IT Security **Nov/2013**
Awarded by: Masaryk University, CEPIA Technologies, Trusted Network Solutions
Project: *Human Gait Recognition Based on Body Component Trajectories*

Swedish Innovation Prize – 1st place in Civil Security **Feb/2013**
Awarded by: Embassy of Sweden in Prague, SAAB
Project: *Gait Recognition for Biometric Surveillance*

Certificates

Key Competencies in International Academic Communication **Dec/2015**
Issued by: Language Centre at Masaryk University

Graduate Professional Skills **Aug/2015**
Issued by: School of Graduate Studies at University of Toronto

Teaching Fundamentals Certificate **Jun/2015**
Issued by: Centre for Teaching Support and Innovation at University of Toronto

TOEFL iBT **Mar/2014**
Issued by: ETS Global
Note: Score 94, equivalent of C1 in English language

Memberships

Institute of Electrical and Electronics Engineers **2016 – present**

National Postdoctoral Association **2019 – present**

Computer Skills

- Programming languages: Java, C, MATLAB, Python
- Development tools: NetBeans, Weka, PyTorch, TensorFlow, Keras, Git
- Machine learning: deep convolutional neural nets, recurrent neural nets, transformers
- Web: PHP, HTML, CSS
- Spreadsheet design: Microsoft Office, LaTeX

Hobbies

Mountain Gang, cycling expedition, TaeKwon-Do, geography, Latin American music, parachute