ERCIM "ALAIN BENSOUSSAN"
FELLOWSHIP PROGRAMME

ERCIM
European Research Consortium
for Informatics and Mathematics

Scientific Report

First name / Family name	Philipp Terhörst
Nationality	Germany
Name of the *Host Organisation*	Norwegian University of Science and Technology
First Name / family name of the *Scientific Coordinator*	Kiran Raja
Period of the fellowship	01/08/2021 to 31/07/2022

I – SCIENTIFIC ACTIVITY DURING YOUR FELLOWSHIP

During my fellowship, my main scientific activities focused on doing research directly (conducting experiments and writing papers) or indirectly (through supervising students and collaborations). The supervision included the supervision and scientific guidance of two Ph.D. students as well as five regular Bachelor- and Master-level students. Of the thesis students, one finished and one will probably finish by end of July. The other three are in an early stage of their thesis and will probably need the remaining year for the thesis completion.

Besides supervision and research, I helped make the research group grow. This included conducting interviews for Ph.D. position with Prof. Raja as well as writing a research proposal for Marie Skłodowska-Curie Actions (MSCA) 2021 and two proposals for the Research Council of Norway (RCN) 2022.

Lastly, I used the collaborations and connections that this fellowship offered me to organize a workshop on Fairness in Biometric Systems at the International Conference on Pattern Recognition (ICPR) 2022 (https://sites.google.com/view/icpr2022-fairbio). This will take place after the end of this fellowship on 21.08.2022.

II – PUBLICATION(S) DURING YOUR FELLOWSHIP

This one-year fellowship resulted in several publications. Three of these are already published or accepted and are shown under "Accepted publications". Since the reviewing process often takes several months and the fellowship is restricted to one year, four additional publications are currently under review. These papers are listed as "under review". Some parts of the conducted research involved comprehensive analysis and high computational costs. Therefore, bringing these results and developed methods to paper is under process and will probably result in publications after the end of this fellowship. These works are listed under "Planned publications".

Accepted publications

- D. Osorio-Roig, C. Rathgeb, P. Drozdowski, P. Terhörst, V. Štruc, C. Busch: "An Attack on Facial Soft-biometric Privacy Enhancement". IEEE Transactions on Biometrics, Behavior, and Identity Science (T-BIOM) 2022
- M. Huber, P. Terhörst, A. T. Luu, F. Kirchbuchner, N. Damer: "Verification of Sitter Identity Across Historical Portrait Paintings by Confidence-aware Face Recognition". IAPR International Conference on Pattern Recognition (ICPR) 2022
- M. Huber, P. Terhörst, F. Kirchbuchner, N. Damer: "On Evaluating Pixel-Level Face Image Quality Assessment". IEEE European Association for Signal Processing (EUSIPCO) 2022

Under review

- P. Terhörst, F. Bierbaum, M. Huber, N. Damer, F. Kirchbuchner, K.Raja, A. Kuijper: „On the (Limited) Generalization of MasterFace Attacks and Its Relation to the Capacity of Face Representations". (under review IJCB) 2022
- M. Huber, P. Terhörst, F. Kirchbuchner, N. Damer, A. Kuijper: "Stating Comparison Score Uncertainty and Verification Decision Confidence Towards Transparent and Accurate Face Recognition". (under review WACV) 2023
- P. Terhörst, M. Ihlefeld, M. Huber, N. Damer, F. Kirchbuchner, K.Raja, A. Kuijper: „QMagFace: Simple and Accurate Quality-Aware Face Recognition".". (under review WACV) 2023
- P. Terhörst, M. Huber, N. Damer, F. Kirchbuchner, K.Raja, A. Kuijper: „Pixel-Level Face Image Quality Assessment for Explainable Face Recognition".". (under review WACV) 2023

Planned publications

- Y. Xu, P. Terhörst, K. Raja: „A Comprehensive Analysis of AI Biases in DeepFakes Detection"
- P. Terhörst, A. Mader, K. Raja, A. Kuijper: "A Fair, Privacy-Preserving, and Explainable Face Recognition Solution"

III – ATTENDED SEMINARS, WORKHOPS, CONFERENCES

Due to the Covid-19 pandemic, all attended events happened online. More precisely, I was selected as a participant for GYSS 2022, attended as a speaker on GCPR 2021, and presented my scientific work at IJCB 2021.

- Global Young Scientist Summit (GYSS) 2022
- German Conference on Pattern Recognition (GCPR) 2021
- International Joint Conference on Biometrics (IJCB) 2021

IV – RESEARCH EXCHANGE PROGRAMME (REP)

The Research Exchange Programme (REP) was carried out with Fraunhofer Institute for Computer Graphic Research IGD in Darmstadt. It consists of a one-week programme that started on 29.11.2021 and ended on 06.12.2021. The exchange was supervised by Prof. Dr. Arjan Kuijper (arjan.kuijper@igd.fraunhofer.de). From the research perspective, the focus was on current challenges in face recognition systems. It involved many discussions of ideas with various face recognition experts, as well as planning future collaborations and experiments.