



**BEST PAPER AWARD**

**PREISTRÄGER**

»IMPACT ON SOCIETY«



**COMPUTER GRAPHICS NIGHT**

Thursday, December 01, 2022

# Best Paper Award

PREISTRÄGER  
»IMPACT ON SOCIETY«



Terhörst, Philipp (Fraunhofer IGD / TU Darmstadt GRIS)  
Kolf, Jan Niklas (Fraunhofer IGD / TU Darmstadt GRIS)  
Huber, Marco (Fraunhofer IGD / TU Darmstadt GRIS)  
Kirchbuchner, Florian (Fraunhofer IGD / TU Darmstadt GRIS)  
Damer, Naser (Fraunhofer IGD / TU Darmstadt GRIS)  
Morales, Aythami (Univ. Autonoma de Madrid)  
Fierrez, Julian (Univ. Autonoma de Madrid)  
Kuijper, Arjan (Fraunhofer IGD / TU Darmstadt MAVC)

»A Comprehensive Study on  
Face Recognition Biases Beyond Demographics«

*IEEE Transactions on Technology and Society 3, no. 1 (2021): 16-30*

# Best Paper Award

PREISTRÄGER  
»IMPACT ON SOCIETY«



## PROBLEM

- Face recognition systems are increasingly involved in critical daily life decisionmaking processes, such as in forensics and law enforcement.
- Urgent need of non-discriminative face recognition solutions.
- Previous work showed a demographic bias in current solutions
- **What additional factors and facial attributes influence the performance of current facial recognition solutions and thus may treat people unfairly?**

Work	Identities	Images	Attributes (number classes)
Ricanek et al. [56]	0.7k	8.0k	Age (2)
Deb et al. [16]	0.9k	3.7k	Age (cont.)
Srinivas et al. [66]	1.7k	9.2k	Age (2)
Michalski et al. [46]	26.9k	4.7M	Age (cont.)
Albiero et al. [2]	26.9k	151.6k	Gender (2)
Albiero et al. [3]	15.9k	101.3k	Gender (2)
Vera-Rodriguez et al. [76]	0.5 k	169.4k	Gender (2)
Cavazos et al. [2]	0.4k	1.1k	Ethnicity (2)
Krishnapriya et al	22.7k	3.3M	Gender (2), Ethnicity (2)
Serna et al. [60]	55k	1.4M	Gender (2), Ethnicity (4)
Acien et al. [1]	1.7k	13k	Gender (2), Ethnicity (3)
Hupont et al. [36]	0.6k	10.8k	Gender, Ethnicity (3)
Robinson et al. [57]	0.8k	2.0k	Gender (2), Ethnicity (4)
Srinivas et al. [65]	0.7k	8.0k	Age (cont.), Gender (2)
Klare et al. [39]	52,3k	102.9k	Age (3), Gender (2), Ethnicity (3)
Howard et al. [34]	1.1k	2.7k	Age (cont.), Gender (2), Ethnicity (2)
Grother et al. [29]	8.0M	18.0M	Age (5), Gender (2), Ethnicity (4)
Georgopoulos et al [26]	1.0k	41.0k	Age (5), Gender (2),
Balakrishnan et al. [6]	1.3k	1.3k	Kinship (5), Gender (2), Hair (cont.)
Cook et al. [12]	1.1k	2.7k	Age (cont.), Gender (2), Ethnicity (4), Eyewear (2)
Lu et al. [44]	5.4k	162.5k	Demographics (3), Non-demographics (4)
This work	9.1k	3.3M	<b>Demographics (8), Non-demographics (40)</b>



# Best Paper Award

PREISTRÄGER

»IMPACT ON SOCIETY«



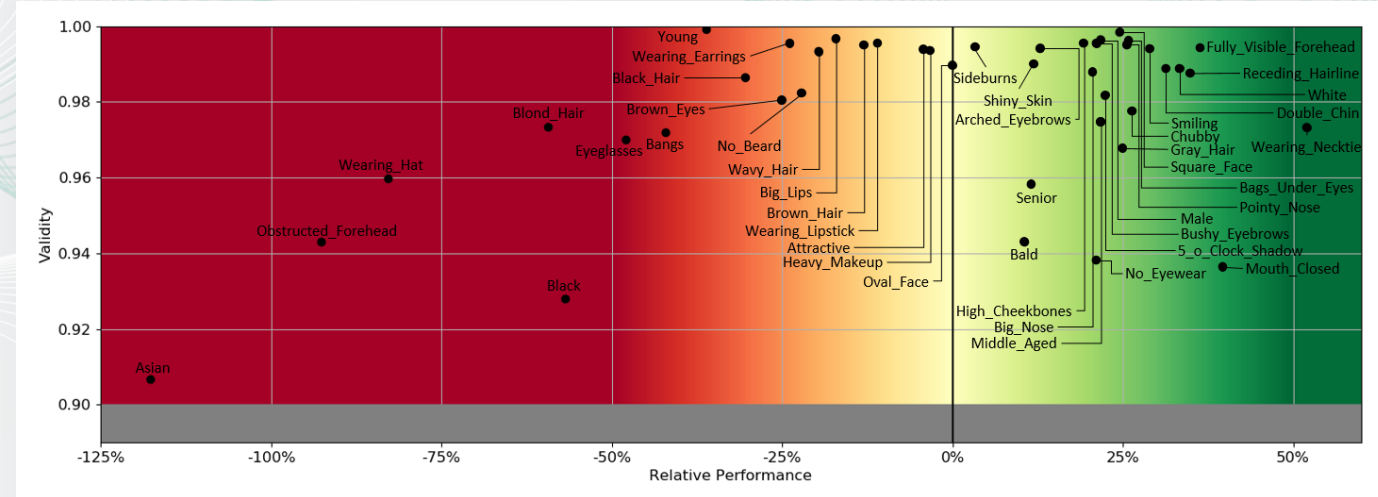
## RESULT

- In depth analysis of the performance differences on two popular face recognition models concerning 47 different attributes.
- Majority of the investigated attributes strongly affects the recognition performance.

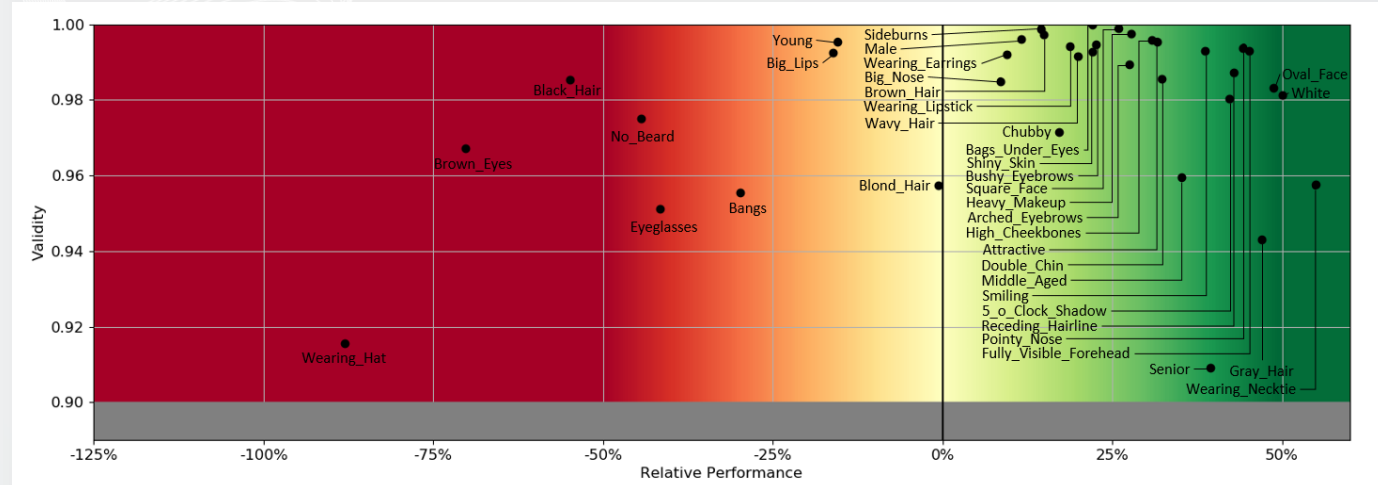


## USP

- The recognition accuracy of current facial recognition systems depends on numerous factors, resulting in unequal treatment of individuals.
- This paper draws attention to this very important problem through a careful analysis and also lists a whole range of necessary further research to make the systems more understandable, robust and fair in the future.



FaceNet



ArcFace