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Leveraging image noise: source camera identification and increased robustness of convolutional neural networks

Bennabhaktula, Guru Swaroop

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Research Activities

List of Papers

- **Bennabhaktula, G.S.**, Strisciuglio, N., Alegre, E., & Azzopardi, G. (2023) – “*PushPull-Net: Inhibition-driven ResNet robust to image corruptions*”, article under review.
- **Bennabhaktula, G.S.**, Alegre, E., Karastoyanova, D. & Azzopardi, G. (2022) – “*Camera model identification based on forensic traces extracted from homogeneous patches*”, *Expert systems with applications*, vol. 260, no. 117769.
- **Bennabhaktula, G.S.**, Timmerman, D., Alegre, E., & Azzopardi, G. (2022) – “*Source Camera Device Identification from Videos*”, *SN Computer Science*, vol. 3, no. 4, 316.
- **Bennabhaktula, G.S.**, Antonisse, J., & Azzopardi, G. (2021) – “*On Improving Generalization of CNN-Based Image Classification with Delineation Maps Using the CORF Push-Pull Inhibition Operator*”, In *Proceedings of the 19th International Conference on Computer Analysis of Images and Patterns, Lecture Notes in Computer Science*, Springer, vol. 13052, pp. 434-444.
- Timmerman, D., **Bennabhaktula, G.S.**, Alegre, E., & Azzopardi, G. (2021) – “*Video Camera Identification from Sensor Pattern Noise with a Constrained ConvNet*”, In *Proceedings of the 10th International Conference on Pattern Recognition Applications and Methods*, pp. 417-425.
- **Bennabhaktula, G.S.**, Alegre, E., Karastoyanova, D. & Azzopardi, G. (2020) – “*Device-based image matching with similarity learning by convolutional neural networks that exploit the underlying camera sensor pattern noise*”, In *Proceedings*

of the 9th International Conference on Pattern Recognition Applications and Methods, pp. 578-584.

Prizes and Awards

- The PhD project, "Forensics against child sexual abuse" won the Ben Feringa Impact Award 2023.
- Attended the International Forensics Summer School (IFOSS 2022) in Sampiere, Sicily and was awarded a scholarship for outstanding academic credentials.

Teaching

- Delivered lectures for the course Information Retrieval at the University of Groningen (2021, 2022, & 2023)
- Teaching assistant for the course Introduction to Computer Science (2021)
- Co-supervised two master's and two bachelor's thesis

Professional Development

- Course on Publishing in English
- Course on Mastering your PhD
- Course on Neural Networks and Computational Intelligence
- Completed several online courses from "Coursera" and "the School of AI" in topics related to deep learning and Python
- Delivered talks at Conferences, reading group meetings, group meetings, and at other venues.