



INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI
SHORT ABSTRACT OF THESIS

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Universal Identity Independent Face Counter-spoofing
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SHORT ABSTRACT

Owing the ubiquitous deployment of face-recognition units at various points, "face-masquerading" is certainly possible via synthetic facial-imitations of some target individual. These "imitations" can be executed either in a crude way with a planar print/digital image or in a much more sophisticated manner via "prosthetics". Since the spoofing modality/type is hard to predict, what is well understood is the **INTRINSIC NATURAL FACE-SPACE**. Furthermore, **counter-spoofing should operate at a layer where subject-content must be ignored**. What should be learnt is the high-level presentation form of the face or face-like object presented to the still-camera. **On this front, a CONTIGUOUS RANDOM SCAN based architecture is proposed and deployed to build a content-agnostic/subject-independent model for the NATURAL FACE CLASS ALONE. Works effectively against planar-spoofing and even prosthetics despite depth variability (due to the one-mask-fits-many, over-smoothing constraint)**. The "contiguous random scan" is a technology transfer from an application invented by Matias and Shamir (1987) which involved application of SPACE FILLING CURVES for compressing encrypted videos. As second contribution, to attack PRINT-SPOOF-presentations, a **CONTRAST REDUCTIONISTIC IMAGE LIFE-TRAIL based on ITERATIVE FUNCTIONAL MAPS is proposed, to segregate natural contrast rich faces with SELF-SHADOWS from PRINT-SPOOF-presentations**. NATURAL face-images tend to have longer LIFE-trails as compared to PRINT-SPOOF-images.