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Illumination Face spaces are Idiosyncratic

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Abstract - Illumination spaces capture how the appearances of human faces vary under changing illumination. This work models illumination spaces as points on a Grass - mann manifold and uses distance measures on this manifold to show that every person in the CMU - PIE and Yale datasets has unique and identifying illumination space. This suggests that variations under challenges in illumination can be exploited for their discriminatory information. As an example when face recognition is cast as matching sets of face images to sets of face images, subjects in the CUM-PIE and Yale databases can be recognized with 100% accuracy.