# ABSTRACT

Distributed Face Recognition Over a Reliable Self Organizing Storage Device Built from Unreliable Distributed Sensor Nodes

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This research describes a set of techniques that allow a set of independent camera nodes, each of which have limited processing, storage and communication capabilities to self-organize into a distributed face recognition system. The system respects amorphous computing assumptions, so minimal a priori con-_guration is required. Storage facilities for recognition templates are provided by a reliable storage device that emerges from a set of unreliable storage nodes with the aid of a shared protocol. The storage protocol partitions the emergent device into a set of backup addresses such that the stored data is robust to the destruction of nodes and communication errors. Query latency bound by number of backup addresses and the average node density. Each node that sees an image free of alignment constraints uses the data in the network to perform data classification. Inter-node collaboration increases the information content on a set of nodes, and is used to achieve system wide consensus. The resulting implementation collates a large set of low quality inputs, reduces bandwidth via online classification, and yields an accuracy which exceeds that of early (circa 2000) centralized PCA-based face recognition systems in a scale-free self-organized deployment.

Keywords: Paul Antonio Gaynor; wireless sensor networks; reliability; self organizing storage; face recognition; distributed consensus.