National University of Science and Technology
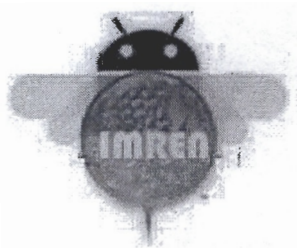## Zimbabwe

Faculty of Applied Sciences
Department of Computer Science

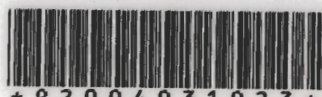## Face recognition using Bayesian networks for Android-based mobile devices (IMREN).

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Abstract

Face recognition is a field that has received so much attention and research. Its application as a biometric has also grown due to the growth of the camera industry. The digital camera's resolution and noise reduction in images makes the camera view the world in more or less the same as a human being. However, this technology has been difficult to implement on mobile devices, phones in particular. This has been chiefly because of the computational compexity of the algorithms used. The memory size and processing speed of the mobile phones has been a constraint as well. There has been a huge growth experienced in the mobile phones' industry with respect to the gadgets' processing power. Face detection has been implemented using other statistical methods but this research uses the Bayesian network. This method is graphical and uses probabilistic inference. This helps in reasoning with incomplete and unknown information. The Bayesian Network is applied on data that would have acquired from a face image using Principal Component Analysis (PCA). PCA is used to reduce the dimensions of the image. The covariances matrix from the principal components is used in the Bayesian network. The Bayesian network uses prior knowledge and the weights on the nodes are modified using weights formulated by a probablity distribution function. This means, unlike other neural networks, the weights of a Bayesian network are not constants. We formulate our problem as the maximum a posteriori (MAP) estimate of a properly defined probability distribution function (PDF). A Bayesian network is used to represent the PDF as well as the domain knowledge needed for interpretation (Kumar and Desai, 1996). The development is done for Android-based mobile phones. The Android is an open source mobile phone operating system that runs on a Linux kernel.