FAU

COLLEGE OF ENGINEERING & COMPUTER SCIENCE

Florida Atlantic University

THE FLORIDA ATLANTIC UNIVERSITY

COLLEGE OF ENGINEERING & COMPUTER SCIENCE

announces the

Ph.D. Dissertation Defense

of

Xin Guan

for the degree of

DOCTOR OF PHILOSOPHY (PH.D.)

MARCH 26TH at **2:00PM**

In

EE Building, Room 405

777 Glades Road

Boca Raton, FL

DEPARTMENT: Computer & Electrical Engineering and Computer Science

DISSERTATION TITLE: *2D/3D Face Recognition*

CHAIR OF THE CANDIDATE'S PH.D. COMMITTEE:
Dr. Hanqi Zhuang

PH.D. SUPERVISORY COMMITTEE:
Dr. Nurgun Erdol
Dr. C. T. Tsai
Dr. Hill Zhu

ABSTRACT OF DISSERTATION

2D/3D Face Recognition

This dissertation introduces our work on face recognition using a novel approach based on creating 3D face model from 2D face images. Together with the pose angle estimation and illumination compensation, this method can be used successfully to recognize 2D faces with 3D recognition algorithms. The results reported here were obtained partially with our own face image database, which had 2D and 3D face images of 50 subjects, with 9 different pose angles. It is shown that by applying even the simple PCA algorithm, this new approach can yield successful recognition rates using 2D probing images and 3D gallery images.

The insight gained from the 2D/3D face recognition study was also extended to the case of involving 2D probing and 2D gallery images, which offers a more flexible approach since it is much easier and practical to acquire 2D photos for recognition. To test the effectiveness of the proposed approach, the public AT&T face database, which had 2D only face photos of 40 subjects, with 10 different images each, was utilized in the experimental study. The results from this investigation show that with our approach, the 3D recognition algorithm can be successfully applied to 2D only images.

The performance of the proposed approach was further compared with some of the existing face recognition techniques. Studies on imperfect conditions such as domain and pose/illumination variations were also carried out. Additionally, the performance of the algorithms on noisy photos was evaluated. Pros and cons of the proposed face recognition technique along with suggestions for future studies are also given in the
dissertation.

BIOGRAPHICAL SKETCH

Born in **1975**
B.S. **1998, Tsinghua University, Beijing, China**
M.S. **2000, Florida Atlantic University**

QUALIFYING EXAMINATION & PUBLICATIONS

Time in Preparation: 10 YEARS

Qualifying Examination Passed: Fall 2003

Selected Publications:

X. Guan and H. Zhuang, "Application of Illumination Compensation for Face Recognition", *Artificial Intelligence and Pattern Recognition 2007*, pp. 255-261, 2007.

H. Zhuang, T. Theerawong, X. Guan, S. Morgera, and A. Pandya, "A Method for Creating 3D Face from a 2D Face Image", *2006 Florida Conference on Recent Advances in Robotics, FCRAR 2006*, 2006.

X. Guan and H. Zhuang, "A Method of Creating 3-D Face Images from 20D Photos for Face Recognition", *Int. J. Biometrics*, Vol. 3, No. 1, 2011