

Cen Rao

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OBJECTIVE

Researcher working on computer graphics and image/video processing algorithms.

SUMMARY

- * An expert in computer vision, image/video processing, and graphics algorithms (OpenCV, OpenGL, MFC, Matlab).
- * A hard working and resourceful person.
- * An excellent learner and multifunctional team worker.
- * An experienced software engineer.
- * Good communication skills.

EDUCATION

Ph.D. , Computer Science University of Central Florida, Orlando, FL. Dissertation "View-invariant Analysis of Human Actions"	1998 – 2003 GPA 3.8/4.0
Master of Engineering Flight Control, Guidance and Simulation Beijing University of Aeronautics and Astronautics Beijing, China Thesis "The Fundamental Algorithms in Image-based Rendering System".	1995 – 1998 GPA 3.7/4.0
B.S. , Computer Science Beijing University of Aeronautics and Astronautics Beijing, China	1991 – 1995 GPA 3.7/4.0

PUBLICATIONS

- * Cen Rao, Mubarak Shah, Tanveer Syeda-Mahmood, "Invariance in Human Action Analysis", ACM Multimedia 2003, Berkeley, CA, USA, November 2-8, 2003.
- * Cen Rao, Alexei Gritai, Mubarak Shah and Tanveer Syeda-Mahmood, "View-invariant Alignment and Matching of Video Sequences", ICCV03, Nice, France.
- * Cen Rao, Alper Yilmaz, Mubarak Shah, "View Invariant Representation and Recognition of Actions", International Journal on Computer Vision, 2002, Volume 50, Issue 2.+
- * Cen Rao and Mubarak Shah, "View Invariance in Action Recognition", IEEE Computer Society Conference on Computer Vision and Pattern Recognition, Kauai Marriott, Hawaii, December 9-14, 2001.+
- * Cen Rao and Mubarak Shah, "View-Invariant Representation and Learning of Human Action" IEEE Workshop on Detection and Recognition of Events in Video. Vancouver, Canada, July 8, 2001.+
- * Cen Rao and Mubarak Shah, "A View-Invariant Representation of Human Action", International Conference on Control, Automation, Robotics and Vision, ICARCV 2000. December 5-8, 2000, Singapore.

* Jiangjian Xiao, Cen Rao and Mubarak Shah, "Morphing for Dynamic Scene" Euro Graphics'02 short paper session, Sep. 2-6, Germany.

+ Papers are referenced by leading computer vision researchers at Boston U., U. Maryland, Ohio State U., IBM research, Siemens research, Inria, the Weizmann Institute of Science in ISRAEL, Intel, etc.

PROFESSIONAL SKILLS

* **Video and Image Techniques:** motion estimation, object tracking, object recognition, 3D/2D projection and 3D reconstruction, automated video surveillance systems, gesture/activity recognition, image filtering, video/image compression and decompression (MPEG-2, MPEG-4, JPEG), image based rendering, video/image retrieval and editing, digital signal processing (DSP) algorithms, human-computer interaction system (HCI).

* **Computer Vision and Graphics API's:** OpenCV, OpenGL, DirectShow.

* **Computer Language:** C/C++, MFC, Java, J2ME, Matlab.

RESEARCH EXPERIENCE

University of Central Florida, Orlando, FL 1998 – 2003
Computer Vision lab, School of Computer Science

Graduate Research Assistant

Focused on video computing, especially on human action recognition. Proposed and implemented a new approach which analyzes motion trajectories to match similar actions performed in different viewing directions. Built an experimental recognition system including tracking of human body parts, trajectory representation and view-invariant trajectory matching. Also explored the areas of gesture and handwriting recognitions. Developed a new approach to synchronize two videos that were taken from two different viewpoints. The algorithm can be widely used in many applications, such as action modeling, animation, and video retrieval.

Completed several projects related to MPEG-2 and MPEG-4, such as motion estimation, panorama, video shot detection, layer segmentation, model-based compression and view morphing. Most of the programs have been written in C++ and Matlab on either Unix or PC.

IBM Almaden Research Center, San Jose, CA. May. 2002 – Aug.2002
User Sciences and Experience Research Group (USER)

Summer Intern as Research Assistant

Developed a human action video retrieval system. Improved previous visual tracking system with state-of-the-art object tracking algorithms, such as mean-shift tracker and condensation motion predictor. Enhanced the detection capability by adding new motion characteristics. Explored new recognition approaches by dynamic time warping. The project was built on Intel OpenCV framework with Visual C++.

Beijing University of Aeronautics and Astronautics 1995 – 1998
Beijing, China.

Institute of Simulation Technology

Graduate Research Assistant

Participated in research projects related to the Visual System of Simulators, including driving simulator, tank pilot training system and flight pilot training system. The projects were focused on rendering interactive and immersive 3D sceneries for users. Participated a fully

commercialized Virtual Reality system - Golf Simulator. Used OpenGL for rendering, and 3DMax for 3-D modeling.

TEACHING EXPERIENCE

University of Central Florida, Orlando, FL.
School of Computer Science

2000 – 2003

Graduate Teaching Assistant

Lab instructor for both Java and C programming courses(COP2253/COP3223) . Work included organizing and giving lab lectures, troubleshooting, homework and quiz grading. Teaching assistant for graduate level automata and computer vision courses(CAP5415/ CAP6411/ COT5310). Work includes grading, answering questions, and substitute lecturing.

MAIN COURSES

Image Processing,
Computer Graphics,
Computer Vision,

Design and Analysis of Algorithm,
Advanced Operating System,
Advanced Computer Architecture,

Pattern Recognition,
Transaction Processing,
Random Processes,