Mohamed E. Hussein

1103 A.V. Williams Building
College Park, MD 20742
Tel: (301) 345 3553
mhussein@cs.umd.edu
http://www.cs.umd.edu/~mhussein/

Research Interests image understanding and computer vision, with emphasis on fast human detection and tracking, and special interest in utilizing graphics processing units in developing very fast techniques

Education

University of Maryland, College Park, MD, USA

Ph.D. in Computer Science, 2008 (expected)
Advisor: Prof. Larry Davis

M.Sc. in Computer Science, Fall 2005
Advisor: Prof. Larry Davis and Dr. Wael Abd-Almageed
Award: Graduate Fellowship, Fall 2002 - Spring 2004

Alexandria University, Alexandria, Egypt

M.Sc. in Computer Science, Summer 2002
Thesis Title: A New Caching Strategy for the DSR Protocol in Ad Hoc Wireless Networks
Advisor: Prof. Nazih El-Derini

B.Sc. in Computer Science and Automatic Control, Spring 1998
Awards: Faculty Certificate of Honor 1994-1998
Graduation Grade: Distinction with Degree of Honor

Selected Course Work Computer Vision, Advanced Computer Graphics, Advanced HCI, Natural Language Processing, Advanced Algorithms, Neural Modeling, Pattern Classification, Information Theory, Statistics, Stochastic Processes, Operations Research, Simulation Modeling, Advanced Computer Networks, Advanced Operating Systems, Network Protocols, Digital Control Systems, and Distributed Database Systems

Skills

- *Programming:*
  - **Languages:** C/C++, Java, Cg (C for graphics), MATLAB, TCL, Perl, Oracle PL/SQL, Visual Basic, Delphi, BASIC, FORTRAN, and Pascal
  - **Libraries:** STL, OpenGL, OpenCV, Intel IPP, POSIX Threads
  - **Environments:** Visual Studio, DrJava, NS-2, Access, and Oracle Developer 2000
  - **Code Optimization:** Experience in C/C++ and MATLAB code optimization
- *Operating Systems:* Windows, Linux, and Solaris
- *Foreign Languages:* native speaker of Arabic

Research Experience

Research Assistant, University of Maryland, College Park, MD, summer 2004-present

- Investigating the utility of using modern graphics processing units in developing fast computer vision algorithms.
- Developing an efficient algorithm and implementation for the Graph Cut algorithm.
- Developed a fast human detection technique that adopts the approach of cascade of boosted weak learners, and histograms of oriented gradients as features, using C++ with Intel IPP and MATLAB.
- Developed a fast human tracking technique based on particle filters and a new appearance model that can be efficiently updated and compared to target regions, using MATLAB.
- Designed and participated in the implementation of a multithreaded real-time system for human detection, tracking, and verification via motion analysis in video sequences taken from a moving camera platform, using C++ with OpenCV, Intel IPP, and OpenThreads libraries.
- Implemented a technique for human detection in static camera video sequences, using

MATLAB and C++. The technique combines a template based approach to human detection with focus of attention on motion areas.

Project Member, University of Maryland, College Park, MD, fall 2004

A classmate and I conducted a feasibility study on using facial expressions, detected using computer vision technology, as a source of implicit feedback for information retrieval systems.

Research Assistant, University of Maryland, College Park, MD, summer 2003

- Participated in the design and conceptualization of the Instance-Based Networking (IBN), which allows network end points to communicate independently from their physical locations.
- Participated in the design and development, using Java and Java RMI, of the Autonomous Transport Protocol (ATP), which is a transport protocol over IBN.

Project Member, University of Maryland, College Park, MD, fall 2002

Worked in a group of three to design and implement, in C++, an efficient object lookup service for NICE group members, where NICE is a hierarchical peer to peer system designed for efficient multicasting.

Teaching Experience

Teaching Assistant, University of Maryland, College Park, MD, Fall 2002-Spring 2004

Courses: Computer Systems Architecture, and Computer Organization

Held weekly and appointment-based office hours, participated in class mail group discussions, provided feedback to instructors on homework assignments and projects, graded homework assignments, projects, and exams, and provided model solutions and implementations for some homework assignments and projects

Teaching Assistant, Alexandria University, Spring 2001-Spring 2002

Courses: Logic Design, and Micro Processors

Held weekly recitation sessions and office hours, prepared, administered, and graded lab experiments, prepared and graded homework assignments and provided model answers to students, and prepared, administered, and graded a midterm exam

Other Professional Experience

Part Time Programmer, ACT, Alexandria, Egypt, Dec 2000-Jan 2001

Participated in Al-Marai Project, in which the database system of Al-Marai Inc., for milk products, in Saudi Arabia, was transformed from Centura/Gupta to Oracle 8 database with Oracle 8 Developer 2000.

Part Time Programmer, H-LOGIC, Alexandria, Egypt, Jul-Aug 2000

Designed a template Visual Basic form that accepts database events and can be used for general database operations, exactly as Access forms.

C, Pascal, FORTRAN, and BASIC Tutor, Alexandria, Egypt, Feb 2000-December 2001

Part Time Programmer, ESCON, Alexandria, Egypt, Jan-June 2000

Developed and upgraded, in Microsoft Access 97, applications for small and moderate size businesses (e.g. bills and accounting).

Programmer, ACT, Alexandria, Egypt, Feb-Nov 1999

Participated in the development of a Human Resources system for large companies, using Oracle 7. The system was used in Aramco Inc., the largest incorporation in Saudi Arabia.

Programmer, H-LOGIC, Alexandria, Egypt, Sep-Dec 1998

Developed, using database and serial communications tools in Delphi 2, a system for automatically recording and accounting for employees' attendance in small companies. The system was marketed for several years.

Publications

Journal

[1] Moustafa Youssef, Tamer Elsayed, **Mohamed Hussein**, Tamer Nadeem, Adel Youssef and Liviu Iftode, "IBN: A Communication Paradigm for Mobile Applications," *ACM SIGMOBILE Mobile Computing and Communications Review,* Oct. 2003, Volume 7 Issue 4

Conference

[2] Wael Abd-Almageed, **Mohamed Hussein** and Larry Davis, "Tracking Articulating Objects from Ground Vehicles using Mixtures of Mixtures," *International Conference on Intelligent Robots and Systems*,

China, Oct. 2006.

[3] **Mohamed Hussein**, Wael Abd-Almageed, Yang Ran and Larry Davis, "A Real-Time System for Human Detection, Tracking and Verification in Uncontrolled Camera Motion Environments," *IEEE International Conference on Computer Vision Systems*, NY, USA, Jan. 2006.

[4] Tamer Elsayed, **Mohamed Hussein**, Moustafa Youssef , Tamer Nadeem, Adel Youssef and Liviu Iftode, "ATP: Autonomous Transport Protocol", *IEEE Midwest Symposium on Circuits and Systems*, Cairo, Egypt , Dec. 2003.

[5] Tamer Elsayed, **Mohamed Hussein**, Moustafa Youssef , Tamer Nadeem, Adel Youssef and Liviu Iftode, "ATP: Autonomous Transport Protocol," *The Eleventh International Conference on Network Protocols (ICNP)*, Atlanta, GA, USA, Nov. 2003.

[6] Moustafa Youssef, Tamer Elsayed, **Mohamed Hussein**, Tamer Nadeem, Adel Youssef and Liviu Iftode, "IBN: A Communication Paradigm for Mobile Applications," *The Ninth Annual International Conference on Mobile Computing and Networking (MobiCom)*, San Diego, CA, USA, Sep. 2003.

Unrefereed

[7] Tamer Elsayed, **Mohamed Hussein**, Moustafa Youssef, Tamer Nadeem, Adel Youssef, Liviu Iftode, "ATP: Autonomous Transport Protocol," *CS-TR 4483, Department of Computer Science, University of Maryland, College Park*, May 2003.

Activities

- Graduate Student Member, IEEE/IEEE Computer Society
- Student Member, ACM
- Member, Syndicate of Egyptian Engineers
- Reviewer, International Conference on Intelligent Robots and Systems (IROS) 2005
- Reviewer, International Journal of Computers and Their Applications