



**HODA MOUSTAPHA**

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## PROFILE

Ph.D. in Computational Design. Specializes in developing software systems that support design activities from conceptualization to evaluation. Searching for a researcher or software engineer position where tasks include the development of innovative interactions and technologies for drawing, designing, and knowledge visualization, in order to support creativity, productivity, or education. Contributed to research in Computational Design and Building Performance. Experience in software engineering (UML), programming (JAVA, C++, OpenGL), web design/development (PHP/HTML). Experience in teaching Architecture and Computing courses. Dedicated and organized team player with a wide range of skills merging design and computing. Communicates in English, French, and Arabic. Received awards for Computational Design work as well as for unique Arabic Calligraphy Designs. Areas of interests include, Geometric Modeling, Computer Graphics, Shape Grammars, Computational Geometry, Computer Vision, Pen Computing, Haptic and 3D User Interfaces, Genetic Algorithms, Augmented Reality, Educational software, and Visual Mathematics.

## EDUCATION

**Ph.D. Computational Design, 2005** - Carnegie Mellon University, School of Architecture, Pittsburgh, PA. (QPA 3.80)  
Thesis: Architectural Explorations: A Formal Representation for Generation and Transformation of Design Geometry.

**M.Sc. Computational Design, 1998** - Carnegie Mellon University, School of Architecture, Pittsburgh, PA. (QPA 3.77)

**B.Sc. in Interior Architecture, 1993** - King Faisal University, College of Architecture, Dammam, Saudi Arabia. (GPA 4.90)

**LANGUAGES:** English - French - Arabic.

## AWARDS (SELECTED)

*Honorable mentions* for the SCS DAY Arts and Photography exhibits in (2009) and in (2007).

*Best Presentation Award and Best Paper Award* - Generative CAD Systems Symposium, Carnegie Mellon (2004).

*Akram Midani Award for International Understanding* - School of Architecture, Carnegie Mellon (2004).

*Prince Mohammed Bin Fahd Award for Academic Achievement*, Dammam, Saudi Arabia (1994).

## POSITIONS

**Visiting Scientist/Technical Design Specialist:** Computer Science Department, Carnegie Mellon (2007-present). Participating in establishing Project Olympus, which aims to strengthen the technology infrastructure in Pittsburgh. Designing/developing the Olympus websites as well as Olympus printed materials. Managing Olympus databases. Coordinating Olympus events.

**Web Applications Developer:** Institute of Complex Engineering Systems, Carnegie Mellon (2006). Engineered and developed web-based collaboration tools for the Co-construction project within the KIVA learning environment.

**Special Faculty:** Instructor for the Summer Internship for Diversity (SID), School of Architecture, Carnegie Mellon (2006). Sessions: Environmental Materials, Design Exploration, Rapid Prototyping.

**Assistant Professor** of Interior Architecture: Art and Design Division, Chatham University, Pittsburgh (2005-2006). Courses: Materials and Assemblies; 3D Design; Computer Design Technologies; Color and Textiles; Intro to GIS Systems. Assembled/organized Materials lab (from scratch). Served on IRB and Faculty Advising Technology Committees. Developed the complete Campus Arboretum Map in a Digital Format using Geographical Information and Global Positioning.

**Research assistant:** Center for Building Performance and Diagnostics, School of Architecture, Carnegie Mellon (2000-2005). Focused on Workplace Productivity Research and tools.

**Co-instructor:** School of Architecture, Carnegie Mellon (2001-2004). Courses: Spatial Constructions, Shape Grammar Implementations, Geometric Modeling and OpenGL programming.

**Graphics/Web Designer and Workshop Coordinator:** Generative CAD Systems Symposium, School of Architecture, Carnegie Mellon (2003-2004).

**Webmaster:** Graduate Programs and Center for Building Performance, School of Architecture, Carnegie Mellon (2000-2002).

**Instructor:** Summer Orientation Program, School of Architecture, Carnegie Mellon (1998-1999). Session: UNIX Programming.

**Teaching Assistant:** King Faisal University, College of Architecture, Dammam, Saudi Arabia (1993-1993). Courses: Basic Design I and Basic Design II.

## **ACHIEVEMENTS (IN SOFTWARE DEVELOPMENT)**

**ICE** (Interactive Configuration Explanation): Developed a framework consisting of a formal notation for design description and a software system for exploring design geometry in three dimensions. The ICE system works by means of the manipulation of generative and relational structures - implemented in C++/STD/OpenGL (2000-2005). An earlier version supported the exploration of reflectional, rotational, and translational symmetries within two dimensional design compositions - implemented in C++/STD/OpenGL(2001).

**EnviroSoft**: A GIS-based application for recording and analyzing, onsite, the causes and effects of problems in buildings - implemented in Visual Basic, using the ArcObjects library (2003-2005).

**EnviroQuest**: A suite of web-based questionnaires for analyzing workplace productivity - implemented in ASP (2001-2003).

**SITE**: An event driven software module for Site analysis within SEED (the Software Environment to support the Early phases in building Design) tool that supports the analysis, design, and evaluation of contextual site conditions - implemented in the ET++ application framework (1997-1998).

**JAMES** (JAVA Architecture for Mobile Extended Services): Case modeler and programmer for the simulation team of the JAMES project, a complex system that uses a smart card to control a vehicle's configuration, maintenance, user preferences and trip planning - implemented in JAVA (1997).

**Room Evaluator**: A knowledge based expert system that evaluates the design of a room, identifying dimension, clearance, and requirement errors - implemented in Clips (1997).

## **COMPUTING SKILLS**

Object Oriented Software Development using UML and OMT notation.

*Programming Languages and APIs*: C/C++, OpenGL, ET++, JAVA/JavaScript, Avenue/ArcObjects, Visual Basic, Clips, Lisp.

*IDEs, CASE and Math applications*: Eclipse, Visual Studio, Codewarrior, Together Control Center, OMTTool, Rational Rose, Maple.

*Web Development Scripts*: HTML/DHTML, PHP/SQL/ASP/PHP. *Web Applications*: HotMetal Pro, DreamWeaver, Flash.

*CAD and GIS applications*: AutoCAD, Microstation, FormZ, SketchUP, ArcGIS, Illustrator, Photoshop, InDesign, Painter, Visio.

*Operating Systems*: MAC Leopard OS, Windows XP, Unix/Linux, Symbian OS.

*Rapid Prototyping*: Laser Cutting, Fused Deposition Modeling (FDM).

## **PUBLICATIONS (SELECTED)**

Moustapha, H. "Architectural Explorations: A Formal Representation for Generation and Transformation of Design Geometry" - PHD Dissertation, Carnegie Mellon University (2006).

Moustapha, H. "A Formal Representation for Generation and Transformation in Design" - Generative CAD Systems Symposium (GCAD'04), Carnegie Mellon University, Pittsburgh (2004).

Akin, Ö. and H. Moustapha, "Formalizing Generation and Transformation in Design: A Studio Case Study" - International Conference on Design Computing and Cognition (DCC'04), Kluwer Academic publisher, the Netherlands (2004).

Akin, Ö. and H. Moustapha "Strategic Use of Representation in Architectural Massing" - Design Studies, Vol. 25, no 1, Elsevier Ltd, London (2003).

Moustapha, H. and R. Krishnamurti, "Arabic Calligraphy: A Computational Exploration" - Mathematics and Design 2001, Third International Conference, Geelong, Australia (2001).

## **REVIEWS, COMMITTEES AND INVITED LECTURES**

Invited member of program committee of the ACM Conference on CREATIVITY & COGNITION (2009).

Reviewer: for the International Conference on Intelligent User Interfaces (2008) and for the International Journal of Systems & Applications in Computer Graphics (2007).

Invited lecture: for the Sustainable Landscape and Architecture Outreach Program (2008).

Guest Lecture: "Exploring Architectural Designs by means of Group Transformations" for the course "Group Theory and its Applications in Robotics, Computer Vision/Graphics and Medical Image Analysis. Robotics Institute, Carnegie Mellon (2005).

Guest Presentation: "Exploring with the ICE system" during the "Construction Kits and Crafts" summit meeting. School of Architecture, Carnegie Mellon (2006).

Student Representative for the Graduate Programs Committee (1999) and Computing Committee (2003) of the Graduate Programs of the School of Architecture, Carnegie Mellon.

**EXHIBITIONS** *(SELECTED)*

SCS DAY, Art and Photography exhibition, Carnegie Mellon (Feb 2008) (Feb 2007) (Feb 2009).

**Spiritual Visions** Exhibition, University Center's Art Gallery, Carnegie Mellon (Nov 5-9, 2007).

Modern Calligraphy Display, Saudi Cultural Event (Carnegie Mellon, Apr 19 2006), (Univ. of Pittsburgh, Nov 10, 2006) and (Univ. of Pittsburgh, Sept 20, 2004).

**Conceptual Expressions** Exhibition University Center's Art Gallery, Carnegie Mellon (Oct 4-17, 2004).

Contemporary Calligraphy Display, Frick Art Museum, in conjunction with the Empire of the Sultan's Exhibition (Jan 8, 2004).

**IN THE NEWS**

Downtown Magazine, Egypt (December, 2007)

Al-Watan Newspaper, Saudi Arabia (February 2, 2005)

The Tartan (April 24, 2006)

Tribune Review Newsmaker (July 13, 2004)