NGUYEN Phu Binh

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Profile

Computer Scientist in the field of Visualization and Image Processing, interested in positions that require strong analytical, programming and research skills in the development of efficient techniques for analyzing and visualizing images and large datasets.

Education

Ph.D. candidate (present), Electrical and Computer Engineering, National University of Singapore (NUS), expected completion date: May 2012.

M.Sc. (Hons.), Information Processing and Communications, Hanoi University of Science and Technology (HUST), 2004. Thesis mark: 9.99/10, GPA: 8.56/10, class rank: 1st/25.

B.Eng. (Hons.), Information Technology, HUST, 2002. Thesis mark: 9.91/10, GPA: 8.30/10, class rank: 2nd/43.

Research Experience

Research Associate. Department of Mechanical Engineering, NUS. Sep 2011 – present.

- Designing and developing a controller for an implantable, real-time, closed-loop glucose monitoring and insulin delivery system.

Research Scholar. Department of Electrical and Computer Engineering, NUS. Aug 2007 – Aug 2011.

- Designed new and efficient 4-D volume rendering techniques for interactive medical simulation.
- Authored and co-authored several international journal and conference papers in the field of visualization and medical image analysis.
- Developed an automatic method based on clustering for transfer function design for medical volumetric data visualization.
- Created a new coding method for time-varying volumetric medical dataset which can achieve a higher fidelity and faster decompression duration compared to other lossy compression techniques producing similar compression ratio.

Graduate Student Researcher. BioSignal Laboratory, NUS. Jan 2008 – Dec 2009.

- Developed a new rendering technique for the interactive simulation of contrast and drugs injection into vascular flow.
- Designed a method to model the vascular tree in liver for the simulation of active needle steering in liver surgery.
- Authored and co-authored two IEEE refereed conference papers.

Research Assistant. MICA (Multimedia, Information, Communication and Applications) International Research Center, HUST. Jan 2002 – May 2002.

- Published one national conference paper when doing the B.Eng. graduation project entitled *"Vietnamese speech recognition using Hidden Markov models"*.
- Won 3rd prize in the *Student Research Contest 2002* organized by School of Information and Communication Technology, HUST.

Teaching Experience

Lecturer. School of Information and Communication Technology (SoICT), HUST. Sep 2002 – Jul 2007.

- Developed lectures and taught undergraduate modules: Computer architecture, Introduction to informatics, Web programming, Microprocessors (primary), Digital electronics, Computer aided design using VHDL, Speech processing (secondary).
- Supervised and examined students' graduation projects.
- Participated in research and international cooperation activities.
- Received a certificate of merit from HUST for working achievements in 2007.

Selected Projects

- **SISU**, a sales management software for AnhDao company, the sole agent in Vietnam for the Chinese leading shoes manufactures Kangnai Group. Jun 2006 – Aug 2006.
- **BackUp Adapter (BUA).** Auto Recovery Technology Corporation (Japan). Jun 2005 – Dec 2005.
  - A hardware-software solution that helps users to backup data from their mobile phones to a hardware device or PC, and allows them to edit and restore data back to mobile phones. The latest version of this system then won the 2nd prize in the national software contest *Vietnam Intelligence 2006*.
  - Developed the communication module between PC and mobile phones.
- **Website for Platin JSC.**, a leading educational software company in Vietnam. Aug 2004.
- **Educational Softwares for Lower Secondary Schools.** Center of Research and Development of School Materials and Teaching Equipment, Institute for Educational Strategy and Program. Apr 2002 – Jul 2004.
  - Created a series of teaching-aid software for teachers in lower secondary schools, which was a part of the *"Lower Secondary Education Development Project"* operated by the Ministry of Education and Training.
  - Co-authored the software product *"Visual and Online Lesson Editor for Teachers (ViOLET)"* which won 3rd prize in the *Vietnam Intelligence 2005* contest, and the 2nd prize in the *Science and Technology Creative Products 2005* contest for the 50th anniversary of HUST.
- **National project #KC.01.09: Advanced Systems and Human-Machine Interaction.** SoICT, HUST. 2002 – 2004.
  - Analyzed and designed the "*Test and Examination System (TES)"* for the sub-project *"Bach Khoa Virtual Interactive Educational Web-based System (BKviews)".*
  - Developed a Vietnamese speech recognition system for the sub-project *"Speech-control Human-Machine Interaction"*.
  - Published two national conference papers when doing this project.
- **Information Collecting and Parsing System (ICPS).** Sep 2002 – Nov 2002.
  - A system that helps users to collect information from any source on the Internet.
  - Won 2nd prize in the *Vietnam Intelligence 2002* contest.

Honors and Awards

- Certificate of Teaching Commendation 2007, HUST
- Science and Technology Creative Product 2005 contest for the 50th anniversary of HUST, 2nd prize
- Vietnam Intelligence 2005 software contest, 3rd prize
- Vietnam Intelligence 2002 software contest, 2nd prize
- Certificate of Merit for the excellent academic result during the course 1997 – 2002, HUST
- Students with Information Technology 2000 software contest organized by SoICT, 1st prize
- National Informatics Olympic 1999 competition for students, 2nd prize

Selected Publications

1. Nguyen BP, Tay WL, Chui CK, Ong SH: A Clustering-Based System to Automate Transfer Function Design for Medical Image Visualization. *The Visual Computer*, 28, 2 (2012), 181-191.
2. Nguyen BP, Chui CK, Ong SH, Chang S: An Efficient Compression Scheme for 4-D Medical Images using Hierarchical Vector Quantization and Motion Compensation. *Computers in Biology and Medicine*, 41, 9 (2011), 843-856.
3. Nguyen BP, Tay WL, Chui CK, Ong SH: Automatic Transfer Function Design for Volumetric Data Visualization using Clustering on LH Space. In *Proc. Computer Graphics International (2011*), pp. 1-10.
4. Wang ZL, Nguyen BP, Chui CK, Qin J, Ang CH, Ong SH: An Efficient Clustering Method for Fast Rendering of Time-varying Volumetric Medical Data. *The Visual Computer*, 26, 6-8 (2010), 1061-1070.

5. Nguyen BP, Do TTT, Chui CK, Ong SH: Prediction-based Directional Search for Fast Block-Matching Motion Estimation. In *Proc. Symposium on Information and Communication Technology (2010)*, pp. 86-91.
6. Qin J, Pang WM, Nguyen BP, Ni D, Chui CK: Particle-Based Simulation of Blood Flow and Vessel Wall Interactions in Virtual Surgery. In *Proc. Symposium on Information and Communication Technology (2010)*, pp. 128-133.
7. Nguyen BP, Chui CK, Ong SH, Chang S: Vascular Flow Rendering for Interactive Simulation of Contrast and Drugs Injection. In *Proc. IEEE Region 10 Conference (2009)*, pp. 1-5.
8. Li BN, Nguyen BP, Qin J, Yang LJ, Ong SH, Chang S, Chui CK: Image Processing and Modeling for Active Needle Steering in Liver Surgery. In *Proc. IEEE International Asia Conference on Informatics in Control, Automation and Robotics (2009)*, pp. 306-310.

Working Skills _____

- **Computer Graphics and Image Processing:** OpenGL, GPU programming (Cg, GLSL, CUDA), Matlab, OpenCV, Real-time rendering, Image enhancement and segmentation, Image compression.
- **Video Processing:** Video processing and analysis, H.264/AVC, Fast motion estimation algorithms, Fast DCT/IT algorithms.
- **Speech Processing:** Emotion recognition from speech, Speech/speaker recognition, Speech synthesis, Digital signal processing.
- **Machine Learning:** Hidden Markov model, Support vector machine, Artificial neural networks, Clustering.
- **Hardware/Embedded Systems Design:** Advanced computer architectures, Microprocessors systems, System-on-chips, Xilinx ISE, ModelSim, Code Composer Studio, Verilog, VHDL .
- **Programming:** C/C++, C#, Delphi/Pascal, Visual Basic, Assembly, GPU-based parallel computing, Multi-core programming (OpenMP), GUI programming (MFC, Qt, FLTK), Design patterns, Web programming (ASP, PHP, JavaScript, XML, XHTML/CSS), Database programming (MS SQL Server, MySQL, MS Access, ADO, ODBC), Network programming (TCP/IP).
- **Applications:** Microsoft Office, Adobe Photoshop, Corel Video Studio, Adobe Audition, LaTeX, EndNote.
- One of the first 25 candidates in Vietnam obtained the *Certificate of the IT Fundamental Engineer Examination*, issued by the Ministry of Economy, Trading and Industry, Japan.