

Executive Summary

Over 10 years of software development experience for consumer applications and human-to-machine interfaces. Diverse technical knowledge, strong problem solving skills and excellent track record of completing tasks quickly. Videos and samples of my work available at: www.marek-knows.com/info

Core Technical Skills

- ◆ Visual C++ OOP & MFC (GUI) programming
- ◆ OpenGL and DirectX 3D software development
- ◆ Network TCP/IP, UDP programming
- ◆ 2D graphic design using Illustrator & Photoshop
- ◆ 3D modeling using Maya
- ◆ HTML, PHP, AJAX, JavaScript, MySQL, Access db

Work Experience

Independent Consultant, Marek-Knows.com, Waterloo, Ontario June 2005 – Present

- ◆ Goal oriented software development. Specialized in 3D visualization using OpenGL and C++
- ◆ Provide consultation on hardware and software prototype designs for clients
- ◆ Plan and execute research and development for new products and software. Comfortable using 3rd party hardware and software tools
- ◆ Maintain and administrate an online forum for game developers

Use of Time: 50% software development, 30% graphic design, 10% testing, 10% business development

Technical Environment: Visual Studio 2008, Adobe Creative Suite CS4, Maya, Microsoft Office 2007, Perforce

Senior Developer, AP Group, Novint Technologies Inc., Albuquerque, NM Oct 2007 – Oct 2008

- ◆ Built touch enabled applications for educational institutions, industrial and medical companies
- ◆ Created an extendable haptic (force-feedback) software framework in C++ for fast development of touch-enabled applications using the Falcon haptic device
- ◆ Wrote software to generate real-time forces calculated by interactions to stiffness, damping and friction
- ◆ Created virtual reality scenes using Maya to texture, rig, animate and model 3D objects
- ◆ Presented demonstrations of haptic technology at international trade shows and at client's offices

Use of Time: 40% software development, 40% graphic design, 10% testing, 10% presentations

Technical Environment: Visual Studio 2005, Adobe Creative Suite CS3, Maya, Microsoft Office 2007, Perforce

Product Developer, Christie Digital Systems Canada, Inc., Kitchener, Ontario July 2007 – Oct 2007

- ◆ Implemented a novel technique for automatically calibrating multiple digital projectors. Image warping and light brightness are tuned to create a seamless image when projected onto an uneven surface
- ◆ Planned and developed the Christie Advanced Color™ software application. The software automatically adjusts the color gamut of all projectors used in an image so that the projected colors are all equal and independent of image warping or lamp age
- ◆ Contributed in weekly technical meetings with members of the software visual environment team

Use of Time: 70% software development, 25% computational analysis, 5% presentations

Technical Environment: Java Eclipse, Visual Studio 2005, Christie proprietary software

Work Experience

Software Developer, Handshake VR Inc., Waterloo, Ontario Aug 2005 – June 2007

- ◆ Co-Invented method for remotely viewing 3D virtual reality simulations across a network using OpenGL, TCP/IP and C++ (Patented)
- ◆ Enhanced custom real-time physics engine; added the ability to deform objects too!
- ◆ Programmed hardware control software using C++ and Matlab RTW for many different haptic devices
- ◆ Collaborated with a small development team to create a sense-of-touch software toolbox
- ◆ Travelled to customer's sites to setup and debug hardware and software systems

Use of Time: 30% software development, 25% graphic design, 25% testing, 20% presentations

Technical Environment: Matlab/Simulink, Visual Studio .NET 2003, Maya, Photoshop, Fogbugs, Source Safe

Systems Designer, Project Leader, Engineering Services Inc., Toronto, Ontario Aug 2003 – July 2005

- ◆ Managed engineering projects, established timelines, and organized meetings with customers
- ◆ Engineered an experimental system for human tests and physiological experiments. Included 6DOF motion platform, real-time 3D visual display output and motion control algorithms
- ◆ Developed eye-tracking software system for research and development analysis studies. Included real-time software for stimulus generation, DAQ and signal processing
- ◆ Implemented motion control hardware and software for electro active polymer artificial muscles and shape memory alloy actuators
- ◆ Produced an oxygen sensor for underwater tests. Included laser control, photon detection circuitry, optical path design and advanced algorithms

Use of Time: 40% project leader, 30% software development, 20% presentations, 10% testing

Technical Environment: Matlab/Simulink, Visual C++ v6, LabView, Microsoft Office 2003, AutoCAD 2002

Software Developer, ORVA Space Corporation, Toronto, Ontario Jan 2003 – Jan 2005

- ◆ Implemented a virtual reality cockpit for a piloted rocket ship. Visualization was implemented using C++ and DirectX
- ◆ Programmed trajectory and dynamics flight simulator for liftoff and decent back down to earth
- ◆ Integrated Matlab/Simulink with C++ program via TCP/IP communication
- ◆ Contributed in weekly engineering design team meetings

Use of Time: 40% Engineering Calculations, 30% software development, 30% presentations

Technical Environment: Matlab/Simulink, Visual C++, Microsoft Office 97

R&D Engineering Graduate Student, InCoreTec Inc., Waterloo, Ontario May 2001 – Dec 2002

R&D Systems Designer, MD Space & Advanced Robotics, Brampton, Ontario Sept 1999 – Dec 1999

Computer Hardware Interfacer, Xerox Research Centre of Canada, Mississauga, On Jan 1999 – Apr 1999

Education

Master of Applied Science (MAsc.), Electrical Engineering, University of Waterloo Jan 2001 – June 2003

- ◆ Specialized in robotics and control engineering
- ◆ Real-time programming using Visual C++, Matlab/Simulink, and LabView
- ◆ Instructed students in the following courses: Digital Computers, Algorithms and Data Structures, Analog Control Systems, Computer Control Systems

Bachelor of Applied Science (BAsc.), Honours in Electrical Engineering Sept 1996 – Apr 2001

University of Waterloo, Waterloo, Ontario

- ◆ Programmed FPGA and TTL/CMOS to create a Ping Pong game
- ◆ Created a real-time alarm clock using Cold Fire 68K microprocessor
- ◆ Built a home security system unit using a 16bit microprocessor and wrote multi-threaded Win32 GUI software to interface to it using RS232

Publications, Patents and Scholarships

Application of Haptic, Visual and Audio Integration in Astronomy Education, IEEE International Workshop on Haptic Audio Visual Environments and their Applications	2006
Co-Inventor of Patent #7,477,250 B2: Method and System for Hapto-Visual Scene Development and Deployment	2006
IRAP Youth Employment Strategy Award	2005
Absorption Spectroscopy Based Oxygen Sensor for Diving Applications, Final Report for Defence Research Development Canada – Toronto, Experimental Diving Unit	2004
da Vinci X-Prize Space Project – Mission Analysis, Proceedings of 3rd International Symposium on Atmospheric Re-entry Vehicles and Systems	2003
Modeling Friction through the use of a Genetic Algorithm, Master's Thesis	2002
Intelligent Friction Compensation in a Harmonic Drive, IEEE Newfoundland Electrical and Computer Engineering Conference (NECEC) paper	2002
Co-Inventor of Patent #60/423,986 for Intelligent Friction Compensation	2002
NSERC Industrial Postgraduate Scholarship	2001 - 2002
NSERC Undergraduate Student Research Award	2000 - 2001