CARTIK S. SHARMA

Medical Imaging/Device Principal

1192 Avenue Road, 1st Floor B, Toronto, ON, M5N2G1

240-460-3000 : cartik_sharma@yahoo.com

Medical Device Professional with a knack for applying innovation and creativity in the clinical domain. My experience involves developing image processing solutions across various imaging modalities and applying optimization and statistical data mining techniques to engineering and business management. My experience and background are geared towards researching existing technologies, applying continuous improvement strategies, working with Clinical trials and with senior management to deliver best in class solutions.

Development & Implementation • Troubleshooting• Medical Image processing • Innovation • OS Design User Interface • Human Computer Interaction • Processing efficiency • Project Management • Software • Firmware • Team Development & Management • Client Interaction • Presentation

---

EDUCATION & CREDENTIALS

State University of New York at Buffalo M.S. Mechanical Engineering GPA: 3.71/4.0
Specialization CAD/CAM/Graphics.
Victoria Jubilee Technical Institute B.E. Mechanical Engineering, GPA: 3.5/4.0
Engineering Management Certification International A.S.M.E

Technical Experience

Application Software: ANSYS, Pro Engineer, Design Optimization Tools. (DOT)
Operating Systems: Windows (XP/2000/NT), MAC OSX, Ubuntu, Red HatLinux, Unix
Process tools: Agile, Continuous integration, ISO 9001, ISO 13485, QSR

Professional Experience

MacDonald Detwitter and Associates (2/11 to 5/11)

Development of software practices and design support including documentation for surgical robotics and the NeuroArm project.
Work with architectural overview and requirements analysis for the NeuroArm project.

SUNNYBROOK HEALTH SCIENCES CENTER (5/10 to 12/10)

Design and development of image analysis tools for optimal cardiac clinical outcomes.

NAVTEQ (3/2010 TO 5/2010)

Design and development of software libraries for feature extraction in the navigation & geospatial positioning system industry.

SIMQUEST INTERNATIONAL LLC (4/2009 to 10/2009) — Sr. Software Engineer

- Design and development of a cranio-maxillofacial viewer for segmentation, rendering and analysis of various tissue types.

- Design of GUI components in Qt. Implement prototype User Interfaces and layouts for various configurations.
- Implementation of surface rendering techniques in open source programming APIs, ITK and VTK.
- Design of software components with the unified modelling design notation for object oriented design.

ROBODOC, *a Curexo Technology company* **(11/2007 to 12/2008) Sr. Engineer**
Robodoc manufactures surgical robots and CT-based orthopaedic image planning systems
Major contributions

- Redesign of the Revision Hip computer assisted and planning procedure. This involved cavity generation and display in 2D and 3D, robot tool path generation and transfer media creation.
- Implementing SROM implant cavity generation for trochanteric bone.
- Developed a platform to display cut cavity and toolpath generated in 2D and 3D.
- Feature implementation for the Orthopedic templating software and porting the Orthodoc planning using C/C++, MOTIF and OpenGL
  station from Slackware to Ubuntu.
- Execute validation tests for cut paths generated and tool paths created by Revision HIP.
- Creating documentation as part of a team for FDA approval for hip surgery planning.
- Worked with regulatory and quality personnel, Class II design requirements.
- Project planning for next generation features, working with 3rd party vendors, working with orthopaedic surgeons, preparing for cadaver labs, on site validation of bone cutting simulation.
- Perform regression testing on the SROM cavity generation module.
- Develop various GUI concepts for the Orthodoc planning station.

Mckesson Medical Imaging (9/2006 to 7/2007) Development Engineer (Contract)
World leaders in Picture Archiving and Communication systems
Major contributions

- Creating a DICOM pattern generation testbed in Visual C++. Implementing a design framework for various modules in the DICOM Test Generation Framework using Rational Rose.
- Key contributor in the Clinical Series Mapping/Sequencing team using the LUA scripting language.
- Identifying, troubleshooting and providing fixes for customer site issues and also offering long term solutions in terms of feature enhancements for the Sequencing group.
- Work with Mckesson PACS systems for field upgrades, service and customer service concerns.
- Understand IP architecture, image pipeline and front end features for integrating/interfacing with PACS providers.

VSM Medtech Ltd. (11/2005 to 8/2006) Software Engineer, Imaging/Graphics/Visualization
Makers of Magnetoencephalography systems (High precision modality for neurological imaging)
Major contributions

- Design and develop a new graphical user interface for a magnetoencephalography system for brain scans.
- Implementing novel 3D rendering techniques (***Spherical harmonics/Marching Cubes)*** for cortical surface segmentation and interpolation.
- Performed vendor comparison and analysis for leading magnetic resonance neuroimaging software.
- Integrated third party visualization software for extracting skull and cortical surface.
- Off the shelf software verification and validation for source localization software as per FDA Guidance 585.

National Research Council of Canada, Institute of Biodiagnostics (12/2004-12/2005),
Research Programmer (*Contract*) Canada's premier research institute
Major contributions

- Implemented techniques for 2D and 3D segmentation as well as ***Region Of Interes***t analysis for brain tumors.
- Two and Three dimensional mesh analysis, mesh processing and surface visualization.
- Design and development of **instrumentation** and software libraries to shim a 3 Tesla **Magnetic Resonance Scanner.**
- Redesigning a linkage mechanism for positioning a probe in the bore of the magnet, interface with firmware and interface modules for a piezoelectric motor.

Monteris Medical Inc. (11/2003 to 11/2004) Software Products Developer (*Contract*)
Makers of thermometric laser interstitial therapy for brain tumors.
Major contributions

- Creating a calibration module for integrating the surgical laser system, cooling system, linear actuator, probe and 4 axis motion controller (QMAC) to create an application for **tumor ablation** using IDL. Creating 2D and 3D annotations for the Image Display and Visualization tool.
- Creating architecture charts, user work flow diagram and work instructions for software products developed in conformance with FDA quality standards, Class III design requirements.
- Vendor selection to provide **DICOM** support for the treatment and planning module.

Z-KAT Inc. (now Mako Surgical) (6/2002 to 11/2003) Software Development Engineer
Makers of image guided surgery software products
Major contributions

- Lead Development Engineer for **image guided surgery** kit for external fixation of the elbow. Implementing diagnostic tools for 2D measurement in fluoroscopy scans.
- Worked closely with engineers at EBI Medical Inc. to interpret drawings, tool and probe characteristics.
- Implemented and validated an algorithm to compute the center of rotation of the elbow.
- Project Lead for Design Transfer of medical device from Product Development/Engineering to Manufacturing
- Create and manage project plans, design input, device design specification, design verification and validation, risk analysis and FMEA compliant with cGMP and Class II FDA design requirements
- Interact with orthopaedic surgeons, medical representatives and potential business partners at product fairs to demonstrate capabilities of the elbow surgery product suite.

Atlantis Components, Inc. (12/01 to 6/02) Cambridge, MA Development Engineer
Makers of custom dental abutments ***(Contract)***
Major contributions

- Implementing algorithms and tools for feature extraction of dental implants and 3D dental arch component slicing in STL models. Worked with C++ and solid modelling packages such as Raindrop Geomagic.
- Part of the development team to implement an object oriented process for virtual design and inspection of custom made abutments to reduce product design time by 20%. with the UG Open API.

The Center for Industrial Effectiveness May 2000 **Research Assistant**
Incubator for collaboration between research and industry
Key accomplishments

- Design and manufacture a 3DOF serial arm **robotic** manipulator.
- Perform calibration, encoder calibration and forward kinematics for measurement of a rim profile for RunFlat tires using C.
- Implement a photogrammetery triangulation technique for measuring the rim profile.

VR and Synthetic Manufacturing Laboratory (5/1999 to 5/2001) Research Assistant,
Research Laboratory at the University at Buffalo, MAE.

Key accomplishments

- Part of a team to implement 3D navigation techniques through a Gear Manufacturing Facility for part flow and layout using C++ and World Tool Kit.
- Finite element simulation of abdominal palpation.
- Finite element analysis of dental implants during mastication.
- Incorporation of using haptics as a modality for quantitative design environments using the GHOST SDK.

VOLUNTEER ACTIVITIES

Event Organizer for Asha Canada, Vancouver, a non profit organization to raise money for kids in third world countries.
Event participant for Operation Red Nose, a courtesy driver's program for New Year's eve, Winnipeg, MB.
Participant for SPIC MACAY, society of promotion of indian classical music and culture amongst youths, Mumbai India.
Donations to the American Diabetes association, the American Breast Cancer Society & the Maryland Chiefs of Police Association.

CONFERENCES

BIOMED DEVICE FORUM 2008, SAN JOSE, CALIFORNIA

Executive member

AAOS 2008, SAN FRANCISCO, CALIFORNIA (American Association of Orthopedic Surgery, 2008)

Grand mathematical challenges in medical image processing, a 2 day workshop in Waterloo, Ontario

5th National Forum on Biomedical Imaging in Oncology BETHESDA, MD

Publications

ISBI 2006, BETHESDA, MD International symposium of biomedical imaging, 2006

A hybrid data analysis and mesh refinement paradigm for conformal voxel spectroscopy. (Poster)

Virtual Systems and Multimedia 2001, BERKELEY, CALIFORNIA

Investigation of a haptic based framework for quantitative design analysis in a virtual environment.

ASME, DETC 2001, PITTSBURGH, PA

Design of a haptics based framework for quantitative design analysis in a virtual environment.