

Vivek Iyer

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EDUCATION

M.S Electrical Engineering,

Arizona State University, Tempe, USA.

B.E. Electronics and Instrumentation,

Birla Institute of Technology and Science (BITS), Pilani, India.

WORK EXPERIENCE

PacketVideo Network Solutions, A division of Alcatel-Lucent, San Diego CA. Apr 2005 - Present

Software Development Engineer

- Member of the System Engineering Group handling research, prototype and product development.
- Key member of three person [Multimedia Transcoder](#) team. I was involved in all aspects of product architecture, system design, requirements evaluation, work estimation, solution design and implementation.

Arizona State University, Tempe AZ.

Aug 2002 – Apr 2005

Research Assistant, Computer Science Department.

Contributed to the creation of iHumanRecognizer, a portable face recognition system that assists the blind or visually impaired in recognizing people. Principle objective was to achieve robust performance and high accuracy under a wide variety of situations, including variations in pose and illumination.

Tata Elxsi Limited, Bangalore, India

Jun 2001 – Jul 2002

Software Consultant, Digital Signal Processing Group.

Designed and developed multimedia solutions involving MPEG-2 transport streams, MPEG 4 video, MPEG 4 Advanced Audio Codec and optimization techniques for mobile platforms. Technologies used: Microsoft DirectShow, QuickTime, Microsoft Foundation Classes (MFC).

Tata Elxsi Limited, Bangalore, India

Jan 2001 – Jun 2001

Intern, Digital Signal Processing Group

Designed and developed a solution for decoding and streaming MPEG-2 transport streams (both Advanced Television Systems Committee (ATSC) and Digital Video Broadcasting (DVB) compliant) across the network. Was part of a 30 member team working towards building a cable television administration system.

COMPUTER SKILLS

Programming Languages

: C#, C++, C, Java.

Tools

: Microsoft Visual Studio, Rational Rose, Matlab, Eclipse.

Technologies

: Microsoft DirectShow, MFC, ATL, COM, Intel OpenCV, .NET framework, Java Swing, Web services, WSDL, SOAP.

Configuration Management Tools :

Clearcase, SVN, CVS, Visual SourceSafe.

Operating Systems

: Windows 9x/NT/2K/XP/Server 2003, UNIX, Linux, Solaris, Mac OS X.

PROJECTS

Directshow Filters for Mpeg2 TS playback over udp

Designed and developed a Directshow source filter that enabled the playback of Mpeg2 transport streams. The transport stream was received over udp (unicast or multicast). The transport streams could contain Mpeg2, or H.264 video and Mpeg1, Mpeg2, Mpeg4 AAC or AC3 audio.

Multimedia Transcoder

The MMT transcodes common multimedia formats into wireless formats. The supported inputs include: MJPEG from IP cameras, IP based MPEG-2 transport streams and analog capture cards. The MMT is capable of outputting media streams in 3GPP compliant video (MPEG4, H.264) and audio formats (AMR, AAC, AAC+, eAAC+), Windows Media formats (WMV9 audio and video). The MMT uses the remoting capabilities of the .NET framework, and is designed to be scalable and remotely configurable.

- Designed and developed an MPEG-2 Transport Stream demultiplexer based on MPEG-2 TS specifications
- Designed and developed a pluggable event processing handler. This allowed system integrators to incorporate their own event processors without affecting others.
- Evaluated a variety of video and audio codecs and incorporated a number of audio / video encoders and decoders into the MMT product.
- Worked closely with customers to understand requirements, evaluate and resolve issues, provide training.
- Analyzed and developed solutions to maintain multimedia timing, especially related to audio / video synchronization. This was especially difficult due to the variety of inputs allowed by the MMT.
- Supported product development from prototype through productization and into deployment at sites worldwide.
- Created GUIs for configuring the MMT

DirectShow Filters for Custom File Formats

Created DirectShow filters in C++ to enable playback of a custom file format. The filter supports both local playback as well as playback of live streams over the network. The custom file format contains video frames in either JPEG or MPEG-4 format. The filters enable playback in any generic media application, such as Windows Media Player. It supports seeking and playback of these files at different frame rates.

ActiveX and MFC clients for a surveillance application

Created application to playback video streamed over TCP/IP. Client-server communication was by XML commands. It enabled viewing live video from cameras as well as archived video. Implemented video analysis features including motion detection and directional motion detection.

Technologies used: ActiveX and MFC

A small grid implementation using the Globus Toolkit

Used the [Globus toolkit](#) to set up a distributed grid on four machines. The Globus toolkit is a set of services and software libraries to support Grids and Grid applications. This grid is used to test a framework that automatically performs load balancing by partitioning both data and functionality. Achieved automatic load balancing transparent to the operator/user. Performance improvement was demonstrated by comparing the performance of image manipulation functions run on the grid versus on the individual machines.

Development of a license plate locator from streaming video

Developed a format-independent image-processing algorithm to locate license plates in images.

GIF decoder for a mobile platform

Developed a platform-independent and robust GIF decoder. Aimed specifically at a mobile platform, it is highly optimized for memory footprint and performance. Written in ANSI C and completely cross-platform compatible on Linux, Windows and Solaris, it is thread-safe and can handle multiple instantiations.

MPEG-4 video decoder plugins using DirectShow and Quicktime API

Developed DirectShow and QuickTime wrappers for an MPEG-4 advanced profile video decoder, enabling the decoder to run in Windows Media Player and QuickTime Player.

ChronosBrowser

Contributed to an ATSC and DVB-compliant MPEG-2 Transport Stream decoding server and an MPEG-2 client-side video decoder. Media information from Program Specific (PSI) tables was transmitted to clients to allow user-selection of certain MPEG-2 streams. Implemented jog, scan, pause and stop features.

OTHER PROJECTS

Java based UI for configuring the [pvServer](#)

MPEG-4 AAC decoder filter using DirectShow

Speech Recognition using Hidden Markov Models

Lip Reading using Image Processing and Hidden Markov Models

Web-based Signal processing using Virtual Instrumentation

PUBLICATIONS

- Sethuraman Panchanathan, John Black, Mike Rush, Vivek Iyer, “*iCARE - a user centric approach to the development of assistive devices for the blind and visually impaired*”, IEEE International Conference on Tools with Artificial Intelligence 2003. Pages:641 – 648
- Terri Hedgpeth, Mike Rush PE, Vivek Iyer, John Black, Mehmet Donderler, Sethuraman Panchanathan, “*iCare-Reader - A Truly Portable Reading Device for the Blind*”, Assistive Technology and Accessible Media in Higher Education 2003.
- Vivek Iyer, Prem Kuchi, Raghuram Hiremagalur, Sethuraman Panchanathan, “*Characteristics of Gait of Humans with Incomplete Spinal Cord Injury*”, accepted for publication in the 26th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Sep, 2004.