



**Amgen, Inc.  
Contractor****Thousand Oaks, CA****Apr '03-Mar '04**

Dr. Freedman developed algorithms and software in MATLAB and FORTRAN for simulation and data modeling.

**Cyra Technologies, Inc.  
Senior Hardware Engineer****San Ramon, CA****Nov '02-Apr '03**

Dr. Freedman designed, developed, and tested algorithms and software for calibrating a three-dimensional laser scanner. He calculated the statistical distribution of outcomes for an engineering tolerance stack by modeling and simulating the scanner response using a Jacobian sensitivity matrix to compare alternative placements of scanner calibration targets based on a D-matrix of scanner response.

**Media Logic Systems Ltd.  
Chief Systems Engineer****Fleet, England UK****Jan '00-Oct '02**

Dr. Freedman designed and developed a novel live interactive television systems (iSeeTV) in which served as a User Interface for customer communication with human sales agents in video-enabled call centers implemented via television and telephone, deployed to 50,000 subscribers of Telewest, UK.

He researched and developed tools and encoder systems to optimize image quality at prescribed latency and bit rate for distributing live video and audio streams encoded via low latency methods including MPEG-2 Simple Profile at Main Level (CATV), MPEG-4 Visual Profile with background sprite coding, and H.263+ (now known as H.264).

Dr. Freedman investigated the feasibility of wavelet-based software encoding schemes with motion compensation and perceptual quantization described by the MPEG Standards Committee Interframe Wavelet Ad Hoc Group. He interfaced video streams via ATM transport to Telewest, UK regional CATV head-ends switched via Harmonic Narrowcast Gateways for distribution via Video On Demand or Near Video On Demand systems to customer's homes.

**Replay Networks, Inc.  
Contractor****Mountain View, CA****Dec'99-Jan '00**

Dr. Freedman researched and developed a method of porting an application developed for a Digital Video Recorder in the embedded C software language to standard set top box (STB) middleware to eliminate high development and maintenance costs associated with developing custom STBs. He optimized bit rate and encoder chip parameters to yield high-quality time-shifted MPEG-2 streams controlled by VCR-like consumer controls.

**Sun Microsystems, Inc.  
Software Engineer (Contractor)****Cupertino, CA****Mar '99-Nov '99**

Dr. Freedman researched and developed a Distributed Component Object Model (DCOM) software interface between a TV Control Graphical User Interface and the Microsoft Broadcast Application Programming Interface (API) to improve the visual quality of interactive TV displays derived from UDP/IP datagrams synchronized with MPEG-2 audio/video packet data. The software interface additionally resolved discontinuities in Presentation Timestamp according to a Normal Play Time defined by a Digital Storage Media -Command and Control standard.

He designed and implemented an API written in the pJava and Visual C++ software languages under the Windows CE operating system for the Motorola DCT 5000+ DTV Set Top Box based on the Advanced Television Systems Committee digital television standard.

**Rockwell Collins, Inc. Pomona, CA Oct '98-Mar '99**  
**Lead Systems Engineer (Contractor)**

As Lead Systems Engineer with a two-engineer span of control, Dr. Freedman timely delivered harmonized requirements for an MPEG-2 in-flight entertainment system similar to a cable television system based on an advanced intranet implemented on an aircraft.

He trained his team to use a Rational Unified software development process based on a Spiral Development Model implemented in the Universal Modeling Language using the Rational/Rose 98i Computer Aided Software Engineering tool.

**Stratagene, Inc. La Jolla, CA Aug '98-Oct '98**  
**Engineer (Contractor to Permanent)**

Dr. Freedman evaluated frame grabber hardware for resolution and quality of time-integrated imagery and specified algorithms including cluster analysis and trending, further developing a user interface for a digital image processing system supporting gene-cloning science.

**United Advanced Technologies, Inc. Long Beach, CA Feb '98-Aug '98**  
**Firmware Engineer (Contractor)**

Dr. Freedman analyzed and developed a nine-camera remote surveillance system with a Graphical User Interface developed in the Visual C++ software language under a Microsoft Windows operating system host and firmware developed in the embedded C software language implemented on Analog Devices' ADV601 wavelet video hardware.

He researched and developed Video for Windows parameters and on-chip settings for video quality control to deliver full-frame video over Plain Old Telephone Service telephone lines at quality acceptable to retail store security services.

**KeyInfo Services, Inc. Spring Valley, CA Mar '98-May '98**  
**Database Consultant**

Dr. Freedman administered a database for providing web-based information developed in the Sybase SQL software language.

**Mitek Systems, Inc. San Diego, CA Aug '97-Jan '98**  
**Engineer (Contractor)**

Dr. Freedman researched and developed an Intelligent Character Recognition digital image processing system based on neural nets implemented in the C software language to read handwritten checks and paper forms with about 80% accuracy on a real-time system deployed throughout the banking industry.

He researched and developed algorithms based on mathematical morphology implemented via neural nets to verify handwritten signatures on printed checks.

**Symbionics Ltd. Cambridge, England UK Aug '97**  
**Principal Engineer (Temporary)**

Dr. Freedman analyzed manpower estimates for design, development and testing of an



**Federal National Mortgage Association    Washington, DC  
Software Engineer (Contractor)****Jul '94-Jan '95**

Dr. Freedman designed and developed a Graphical User Interface to monitor and validate loan servicer input for the Loss Mitigation Project. He developed the software in the C software language for a Sun SPARCstation 2 platform under a UNIX operating system.

**Hughes STX Corporation  
Senior Systems Engineer****Greenbelt, MD****Sep '88-Jun '94**

As Spacecraft and Attitude Analyst for a mission to map the relict radiation from the Big Bang at near infrared, far infrared and microwave wavelengths, Dr. Freedman developed, simulated and calibrated the Cosmic Background Explorer (COBE) Attitude Determination System to yield a stable solution for the spacecraft orientation at a quality factor of 2 above customer's expectation. This solution included a quaternion estimator implemented via an Extended Kalman Filter.

He developed, calibrated and simulated the COBE spacecraft subsystem and provided graphical and statistical analysis of the spacecraft telemetry-word database. When a gyroscope failed during the Launch and Early orbit mission phase, he responded rapidly by plotting graphs of the thermal subsystem telemetry until he found a possible cause of failure.

Dr. Freedman developed a spatially referenced database based on a quad-tree data structure, which stored scientific data for comparison of sky maps from COBE with sky maps from other missions that served as a diagnostic user interface for the Diffuse Infrared Background Experiment.

For the COBE mission, he led the systems engineering and end-to-end development of a novel system for compressing data that combined scientific modeling with statistical data compression. He proposed the system concept and prepared the system level specification, design and project schedule. With a team of two engineers, Dr. Freedman tuned the compression system performance to yield a throughput greater than uncompressed data processing with a compression factor of 22-90%. He further designed and developed evaluation tools to ensure the user-transparent system-wide compression of a 380GB dynamic data base at image quality acceptable to scientists.

**University of Maryland  
Research Associate****College Park, MD****Jun '87-Sep '88**

Dr. Freedman researched and developed digital image methods to process terrain models for a combat information processor sponsored by Battelle. It was developed in the C software language on Sun Microsystems workstation for porting to a supercomputer under a UNIX operating system.

He designed low-complexity algorithms for filtering, segmenting, clustering, and path planning based on digital images organized by quad-tree data structures.

**University College London  
Research Assistant****London, England UK****Sep '86-Jun '87**

Dr. Freedman developed digital image processing algorithms to improve image and stereo-matching quality for a digital terrain modeling system based on satellite data. As part of a UK Government Fifth Generation computing project (Alvey MMI-237) in collaboration with Thorn EMI, Royal Signals and Radar Establishment, and Laser Scan Ltd., he developed software and algorithms for affine transformation, edge filtering, kriging interpolation and image stereo matching with sub-pixel accuracy.

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