



Anthony R. Hinson

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<http://www.ahinson.com/>

OVERVIEW

Seeking an algorithm development and/or software development position in satellite image processing.

Currently hold active TS/DoD security clearance.

Spent last 7 years developing photogrammetric and image processing algorithms for multiple imaging systems academically and commercially. Strong software development background in C, C#, VB, and Matlab. Worked on several small-scale and production-level software packages over the last 8 years. 10+ years experience in 3d modeling and animation.

Photogrammetry and Image Processing

Experience designing and implementing image processing algorithms for airborne / spaceborne imaging systems, including:

- Mensuration and Geodesy: Experienced with RPC calculations and corrections. Familiar with UTM, WGS-84, geodetic, geocentric, and topographic coordinate systems and conversions.
- Rectification: Have designed epipolar and georectification algorithms. Familiar with orthorectification.
- Registration: Feature based image-to-image and image-to-point registration techniques and RPC recalculation.
- Data Formats: Parsing and using NITF images and support data (classified and unclassified TREs).
- Disparity: Calculating terrain models using disparity mapping techniques and RPC data.
- Image Enhancement: Experienced with DRA, unsharp masking, Gaussian filters, etc.
- Projection Models: Orthographic, perspective, pushbroom

General Algorithm Development

Experience designing and implementing algorithms, including:

- Correlation: Normalized cross-correlation, optimized sum of absolute differences, rank and census methods, etc.
- Regression: Linear, polynomial, and multidimensional surface approximation techniques.
- Kernel-Based Processing: Experienced with convolution filters, morphological operators, parametric Hough transforms.
- Interpolation: Bilinear, bicubic, nearest neighbor, and irregular interpolation techniques.
- Geometric: Projective geometry, Plücker lines, coordinate system transforms, geometric manipulation and projection, parametric geometry.
- Other algorithms: Multivariate Gaussian, matrix manipulation and linear algebra techniques.

Programming & Prototyping

- Strong programming knowledge:
 - C# (4 years)
 - C (3 years)
 - Matlab (4 years)
 - Visual Basic (2 years)
- Working knowledge of: C++, Java, Assembly language, Fortran, and other programming languages.
- GUI and visualization building experience in: Visual Studio, Motif, OpenGL.
- Experience programming microcontroller-based platforms in assembly and C. Platforms include: Motorola 68HC11, Intel 8051, Pic Microprocessor family.

TECHNICAL EXPERTISE

PROFESSIONAL EXPERIENCE

Systems Engineer Sr. **3/06 – Pres.**
Lockheed Martin – Strike Weapons *Orlando, FL*

Served as lead systems engineer and principal investigator for IRAD evaluating commercial satellite imagery for weapon targeting. Work included algorithm development, software design in C#, and supplying analysis documentation to the government. Task areas included:

- Imagery Evaluation: Evaluated image quality, geolocation accuracy, performance with proprietary targeting algorithms.
- Rectification: Developed algorithms and software for georectifying and epipolar rectifying satellite imagery. Mensuration equations, pixel sampling, and dynamic range were updated when required.
- Mensuration: Used RPC equations to track geodetic location in imagery and determine imaging geometry (Azimuth, Elevation, GSD, etc.) Used mensuration algorithms to render and correlate geodetic wireframe models with image content.
- Disparity: Designed algorithms and software for real-time elevation extraction from stereo imagery using disparity models.

Systems Engineer **12/03 – 3/06**
Lockheed Martin – Spectral Exploitation Project *Valley Forge, PA*

Worked as a systems engineer on a government funded contract, developing and evaluating image processing algorithms. Development activities encompass:

- Formulation. Work with senior engineer on the mathematical formulation of algorithms for image-to-image registration, photogrammetry, and image understanding.
- Prototyping and Revision. Algorithms prototyped and revised in Matlab and C#.
- Final Development. Algorithms coded in C# for insertion into simulator.
- Demonstration. Gave regular technical demos to management and customers.

Research Assistant **1/00 – 5/03**
Center for Intelligent Machines and Robotics *Gainesville, FL*

Worked on cooperative design projects centered on autonomous vehicles. Work included: programming Windows, Linux, and microcontroller systems, designing and prototyping mechanical objects. Research project entailed the conception and creation of a visual, monocular-based vehicle positioning system.

Mechanical Engineer Intern **5/98 – 5/99**
Honeywell, Inc. – Space and Strategic Systems Operations *St. Petersburg, FL*

Worked in the field of guidance and navigation. Performed diverse tasks including hardware design, development of metrics automation software, and writing engineering orders. Involved with daily and weekly meetings with other engineers and clients. Simultaneously worked with multiple departments including, mechanical, electrical, procurement, quality assurance, and various testing labs.

EDUCATION

- **M.S. in Mechanical Engineering** Univ. of Florida
(Minor in Electrical Engineering) August 2003
 - Specialization in machine vision for vehicle tracking
 - Thesis title: Planar Vehicle Tracking Using a Monocular Based Multiple Camera Visual Position System
- **B.S. in Mechanical Engineering** Univ. of South Florida
December 1999

REFERENCES

Robert Castagno Lockheed Martin – JASSM	(407) 356-7010 Software Engineer Sr. Staff
Maurice Gyer Independent Consultant – JASSM	Satellite Algorithm SME
Dr. William Bremner Lockheed Martin – Spectral Exploitation Project	(610) 531-3849 Principle Systems Engineer
George Gargano Lockheed Martin – Spectral Exploitation Project	(610) 531-1685 Program Manager

For algorithm details, software examples, and other general information, please visit
<http://www.ahinson.com/>

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