Bradley Okresik

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Security Clearances: SSBI / DOD Secret

My passion is researching, developing and testing quantitative trading systems. The foundation of my approach to capital markets is a background performing data analysis, modeling, simulation and algorithm development for remote sensors in the aerospace indusrty. I have a strong interest in complexity, chaos, fractal geometry, information theory, estimation, and optimization.

Work experience:

Raytheon: Space and Airborne Systems – **data analyst, modeling & simulation**	2003 – present
Clorox Services Company - Research & prototyping internship	2003 January
Lucent Technologies - Test engineering internship	2002 summer
US Puget Sound Naval Shipyard - Engineer	2001 summer
Butler National Golf Club - Caddie	1990 - 2000 summers
Vail Resorts - Cook	1999 - 2004 Januarys

Education:

Financial markets independent study & research	2006 – 2010
University of Illinois at Urbana-Champaign	1995 – 2003

MS: Materials Science Engineering 3.84 GPA
Two BS degrees: **Electrical Engineering** & **Mechanical Engineering** 3.58 GPA
Minor: Mathematics

Research and Teaching Experience:

Radar **algorithm development** research (patent issued)	2004 - Present
Signal & Image processing: detect, identify, & track	
Teaching Assistantships	2000 - 2003
University of Illinois: Probability & Statics, Mechanics of Materials	
Haystack Observatory at **MIT Lincoln Labs** (REU/NSF)	1999 summer
Tribology research - model & measure recorder head-to-tape interface	

Computer experience:

Matlab	CUDA	Java	C/C++	Photoshop
Visual Basic	Mathematica	SQL	Agilent-ADS	Quark XPress
Fortran	LabView	Motorola DSP56000	Coware SPW	Dreamweaver

Hobbies/Interests/Organized Athletics:

Snowboarding, skiing, hiking, glassblowing, woodworking, sculpture (metal/bronze), yoga, sailing, mountaineering, audio loudspeaker design & construction, golf, fishing.
Competitive history: swimming, distance running, volleyball, marathon, triathlon, cycling.

Awards:

Chick Evans Scholarship - A four-year full tuition scholarship (University of Illinois) awarded to caddies who display excellence in leadership, character, academics, and financial need.

Colorado Outward Bound School - **Gates Leadership Scholarship**. One of 25 full tuition scholarships awarded to students that display exceptional leadership skills. I attended the school's 30-day Alpine Mountaineering Leadership Challenge Course in the San Juan Mountain Range of southwestern Colorado.

Statics	Continuum Mechanics	Analog Signal Processing	Electromagnetics I & II	Differential Equations
Dynamics I & II	Experimental Mechanics	Digital Signal Processing	Communication Systems	Advanced Calculus
Fluid Mechanics	Thermodynamics	DSP Lab	Solid State Electronics	Linear Algebra
Engineering Materials	Mechanics of Materials	Analog Electronic Circuits	Logic Circuit Design	Abstract Algebra
Composite Materials I & II	Classical Physics I, II & III	Electronic Circuits Lab	Logic Design Lab	Probability & Statistics
Chem. & Tech. of Glass	Quantum Physics I & II	Radio Comm. Circuits	Acoustics	MEMS / Nanotechnology
Glass-working I, II, III, & IV	Welding I & II	Materials for Eng Design	Audio Engineering	Micro Fabrication Lab

2018 – **POMDP Machine Learning** – Devloped algorithms using Partially Observable Markov Decision Processes (POMDP) for intelligent decision making in naval missle defense scenarios. I was issued a patent for this novel research.

2013-2017 **Real Estate & Construction** – After purchasing a home and rental property near the ocean in southern California, I remodeled and upgraded the buildings as I learned several trades. I gained experience completing many major projects including plumbing, electrical, stucco, concrete, roofing, tile, framing, finish carpentry, drywall/plaster, and painting.

2007-2013 **Financial Markets Education & Research** – I immersed myself in an extensive self guided education of financial markets including technical analysis, market psychology & mathematical modeling. I thoroughly understand complex derivative strategies and gained experience trading stocks, ETFs, and options on the long and short sides. I studied non-linear dynamics, chaos theory, fractal geometry and their application to measuring random processes. A simulation framework was developed and a cluster of parallel computers were used to test short term trading strategies. Using blind forward looking tests, I discovered short-term profitable biases in the SP500 Index. I built an application to stream data from my brokers servers utilizing two redundant machines in separate locations that communicate with each other and notify me via email, text, and phone call if any anomalies occur. I have the ability to retrieve price data in real time, analyze it and act on this information buying or selling stocks algorithmically.

2009-2014 **Software Education & Projects** – I took several classes in Java, C++, Python, Ruby, Pearl, CUDA, and parallel programming. Lincoln Labs' MatlabMPI was used to execute my financial market simulations across a cluster of multicore computers. My studies enabled me to attain assignments in software engineering developing a modeling framework and custom high performance database for storing radar test data. I joined a team to solve a specific performance problem that required critical thinking, expanding my expertise on the interface between Matlab and Java programming languages.

2008-2010 **Model & Sim** – I supported Next Generation Jammer developing simulation & modeling components for trade studies. The trade studies were used to author a proposal for the production of new radar jammers on the F-18 Growler electronic warefare aircraft. I also worked an R&D project developing algorithms for massive compression of wide area video surveillance from UAVs.

2011 **Structure from Motion** – Our computer vision R&D team developed "structure from motion" algorithms. We were challenged with producing 3D models of urban landscapes using 2D images captured from a camera in motion. Steps include feature extraction, feature matching, point cloud generation and using epipolar geometry to determine the spatial relationship between multiple frames.

2005-2014 **Test Data Processing** – I became an expert Matlab programmer developing several automated system engineering software tools for test data analysis. The tools retrieve and extract data from multiple sources, integrate the data sets, and display results in various visual formats that are easily digested. My software uses VBA (Visual Basic for Applications) code to automatically generate Power Point & Excel reports for tests that are frequently rerun. The tools provide the capability to effortlessly and quickly compare performance metrics and monitor system health throughout product development.

2008 **Electromagnetic Warfare** – R&D effort developing electronic protection algorithms to mitigate the effects of radar jamming. Various aspects of estimation theory were used in different processing domains to cancel interference in our imaging senors.

2007 **Automatic Target Recognition** – I was on a small team investigating automatic target recognition algorithms for radar systems. I worked closely with aerospace technical experts in signal processing, image processing and information theory.

2006 **RF Receiver Modeling** – Guided by senior scientists, I developed a model and simulation of a receiver for synthetic aperature radar. We measured component level characteristics (S-parameters, AMAM, AMPM, Harmonics, ect.) while developing two simulations; one in Matlab and another in Coware's SPW software (Signal Processing Worksystem). Our simulation provided the ability to alter component parameters (such as filter bandwidth) and analyze system response. The results of the analysis allowed us to optimize the design and implementation of our hardware and algorithm.

2005 **Requirements System Engineering** – I supported a requirements verification and validation team that was extremely disorganized when I arrived. I built an SQL database which interfaced to MS Excel & Power Point using Visual Basic for Applications (VBA). The entire team used my application to record data, communicate, track progress and automate status reporting.

2004–present **Thermal Vacuum Space Test** – Our team is responsible for providing a reliable thermal vacuum environment for testing of space flight hardware. Our labs use roughing, turbo, and cryo pumps, residual gas analyzers, quartz crystal microbalance, cold plates, liquid and gaseous nitrogen, and cooling carts to control large environmental test chambers.

2003 **Audio Loudspeaker** – My senior project at University of Illinois was designing and fabricating a high fidelity audio loudspeaker system (mechanical & electrical). I studied Audio Engineering Society research papers before selecting tweeter, midrange, and woofer drivers and developing an integrated system design. I built custom enclosures and wrote Labview software to take measurements of the impedance and acoustic response. The measurements were used to optimize the crossover design in Agilent's ADS software.

2002 **Bell Labs Test Engineering** – Our team designed and implemented production testing of high-speed (80 GB/s) communication routing boards. Eight different test sets shared one expensive 400km reel of optical fiber. I developed Labview software that interfaced with test equipment, implementing a queue and providing communication among the 8 test stations and the reel of fiber.