

KYLE ANDREW MARTIN

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Education	North Carolina State University (NCSU)		Raleigh, NC	
	6/1998 – 8/1999	M.S. Natural Resource Administration, Spatial Information Systems Technical Option		
8/1994 – 5/1998	B.S. Natural Resources Minor: Forestry Graduated Summa Cum Laude <ul style="list-style-type: none"> Independent Study: GIS Database & Application for Lake James State Park 			
Experience	Client/Company	Description	Location	
	4/2012 - Present	Tucker Innovations	Algorithms for Dynamic 4D Volumetric Calculations & Analysis in Electronic Warfare Systems	Charlotte, NC
	8/2011 - Present	Enerco Energy Systems	Asset Mapping Software System	Salisbury, NC
	4/2005 – Present	QCoherent Software (Founder, Purchased in 12/2009)	High Performance Lidar Software Development	Colorado Springs, CO
	5/2005 – 11/2005	RadioSoft	Data Conversion and Terrain Editing Software Development	Demorest, GA
	3/2004 - 5/2005	Watershed Concepts	Hydrology and Hydraulics Software Development	Charlotte, NC
	9/1999 – 3/2004	Merrick and Company	GIS Software Developer	Aurora, CO
	7/2002 – 8/2010	Intera, Inc.	Geo-hydraulic Software Development	Niwot, CO
	9/1999 – 3/2004	Denver University	Adjunct Professor	Denver, CO
		<i>GIS Applications in Natural Resources I & II</i> – intermediate and advanced level courses concentrating on the fundamental spatial concepts and applications of GIS in natural resource management. Course included lectures and practical labs on spatial analysis/queries, modeling, 3D analysis, and error propagation in spatial analysis.		
5/1998 – 8/1999	NC State University	Research Assistant	Raleigh, NC	
	<ul style="list-style-type: none"> Duties: Application development projects, and teaching GIS programming class Thesis Research: Relating wind damage from hurricanes to quantitative measures of landscape position and landform. 			
Computing & Math Skills	<ul style="list-style-type: none"> C / C++ / VB / VB.Net / C# OpenGL / OpenCL / GDI OpenGL Shading Language VB Script / Javascript MFC / STL / ATL / COM / WIN32 Windows / Web Services HTTP Servers / ATL Server .Net Remoting Server API Development (WMS, Extended WMS) C++ Managed Wrappers HTML / XML Java / WorldWind Python (Extensions in C / C++) 	<ul style="list-style-type: none"> ArcView / Avenue / ArcPad ArcInfo (GRID, AML) / ERDAS GDAL, PROJ4 AutoCAD Map (VBA / LISP) ArcGIS / ArcObjects / MapObjects SQL Programming (MS Access, Oracle, SQL Server, DBASE) ASP / ASP.Net / AJAX, JSON Windows / Unix / Linux OS's Coordinate / Projection Sys. Library/API Development Multithreading/Parallel Proc. External Memory Algorithms N-dimensional tree data structures 	<ul style="list-style-type: none"> Vector and Matrix Math Linear Algebra Computational Geometry (topological, relational, and proximity operations, clipping, dissolve, union, and intersection of geometries) Surface Interpolations (IDW, Spline, Kriging, TIN) File Encryption Algorithms File Compression Algorithms Pattern Matching / Detection 2D and 3D Topologies Intersections of Quadric Surfaces 	
	Honors	<ul style="list-style-type: none"> Eagle Scout Dean's List every semester Xi Sigma Pi Rho Phi Lambda Completion of the Honors Program in the College of Forest Resources at NCSU 1999 J. Herbert Stout Award for Outstanding Student Paper in GIS 2002 Photographer's Forum Award of Excellence Finalist 2002 Photographer's Forum Contest 		
Hobbies	<ul style="list-style-type: none"> Nature/Wilderness Photography Reading Wilderness Backpacking 			

Selected Project Descriptions

The following are brief descriptions of recent selected projects.

High Performance Lidar Software (Purchased by Geocue in 12/2009)

Programming Skills	<ul style="list-style-type: none"> • C++ • OpenGL • ArcObjects • .Net Remoting • ASP/ASP.Net • Algorithm/Mathematical/Geometry development • COM/ActiveX • Web Service Development • File Encryptions Algorithms • Object Library Development
Description	<p>Founder and senior design and development engineer in development of the LP360 Limitless LIDAR™ software suite from QCoherent Software. Participated in all phases of the development cycle from design, development, testing, and maintenance including development of the context sensitive help system. LP360 is a lidar software system which includes an ArcGIS extension, web server, stand alone application, and object library (LPObjets™) for custom development of user solutions. Major highlights in design and development include:</p> <ul style="list-style-type: none"> • Custom data layer that displays large quantities of lidar point clouds quickly at all map scales including profile and perspective viewers • Development of dynamic surface system to construct a TIN surface from lidar point clouds on-the-fly, optionally utilizing breaklines from multiple geographic sources • Hand editing tools for editing of the point cloud within orthographic and profile views • Node-lock licensing system including floating license capability • Development of COM based software library for maximum code reuse in multiple application environments without penalty of performance and for development of custom solutions outside or within applications • Development of web server to expose core functionality of the software for the display of lidar datasets on the web • Development of standalone mapping application that displays lidar datasets similarly as the LP360 ArcGIS extension with a Table of Contents including dockable windows for the profile and perspective viewers • Development of Filtering and Extraction framework that includes a planar point filter, and a point grouping, tracing, and squaring extractor. • Development of algorithms to extract features such as stockpile toes from point clouds originating from UAV missions via structure from motion, dense image matching, or point clouds from imagery. • Development of a fully featured set of tools for editing geometries in a three dimensional environment.

Photography Archive Application

Programming Skills	<ul style="list-style-type: none"> • VB.Net • SQL Programming with Access • Database Design
Description	<p>An application in VB.Net was built to display and modify the contents of an Access database used for archiving images, and the data associated with the images. The application is used by Kyle's Wilderness to maintain a searchable catalog of images, compositions and associated data with each</p>

	piece of artwork. The database is used as the backend and driver for the Kyle's Wilderness Photography website.
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Data Converter/Terrain Editor Software

Programming Skills	<ul style="list-style-type: none"> • C++ • OpenGL • File Compression Algorithms • Algorithm/Mathematical/Geometry development • COM/ActiveX
Description	The data conversion application converts SRTM files (hgt, flt) into a proprietary raster file format with/without compression. Uncompressed raster files were then edited with the terrain editor application. The terrain editor application uses tools to fill in gaps in the SRTM data. Tools to conduct the gap filling include setting pixels a certain value, copy/paste pixels from other data sources, and interpolating the gaps using inverse distance weighted and spline methods. After editing, the raster files were then compressed for use in other software packages.

Automated Contour Annotator *Presidents Award Nomination (2003)*

Programming Skills	<ul style="list-style-type: none"> • C++ • ArcGIS • Algorithm/Mathematical/Geometry development
Description	Program to place contour annotation on index contours in a batch mode. Placement routines were written in C++ with a front end GUI written in VB, all running on top of ArcObjects. The routines are fed inputs ranging from annotation frequency, distance to planimetric features, curvilinearity of the contours, text height, width, and performance/speed settings.

Contour Depression Coder *Presidents Award Nomination (2003)*

Programming Skills	<ul style="list-style-type: none"> • C++ • ArcGIS • Algorithm/Mathematical/Geometry development
Description	Program that codes depression contours in batch mode based on an underlining surface. Coding routines were written in C++ with a front end written in VB, all running on top of ArcObjects.

Flight Mission Planning *Presidents Award Nomination (2003)*

Programming Skills	<ul style="list-style-type: none"> • C++ • ArcGIS • Algorithm/Mathematical/Geometry development
Description	Extensive application for the complete planning of a LiDAR and/or photography (conventional or digital) mapping mission. Includes autolining routines, 3D support for flight line breaks using USGS DEMs or TOPO!. Application written in VB as an extension to ArcMap with a moderately sized flight planning C++ object library.

Hydrology and Hydraulics Data Model and Software

Programming Skills	<ul style="list-style-type: none"> • Visual Basic • Database (MS Access, SQL Server, Oracle) development • Algorithm/Mathematical/Geometry development
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Description	A data model was designed for conducting flood mapping studies. Software was developed to perform the hydrology and hydraulics (incomplete) analysis to support the flood mapping studies. Hydrological routines developed included basin delineations, stream network generation, and time of concentration (TC) calculations. The software was designed to use the data model in an MS Access, SQL Server, and/or Oracle database.
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Visual Hydraulic Model Editor

Programming Skills	<ul style="list-style-type: none"> • Visual Basic • WinAPI
Description	A visual editor for approximate and detailed hydraulic models was developed for use in the WISE software. WISE is a pre and post processor software for flood plain mapping. The visual editor is used to view and edit cross sections and structures (i.e., bridges, culverts, and weirs) to prepare an area for hydraulic modeling of maximum rainfall discharge amounts. The editor was developed in VB.

Automatic Flood Plain Mapping

Programming Skills	<ul style="list-style-type: none"> • Visual Basic • Algorithm/Mathematical/Geometry development
Description	A routine was developed to delineate flood boundaries based on discharge levels at cross sections along a stream. The routine has parameters to allow the user to filter out small polygons based on area and a shape metric (i.e., circularity). The closed boundaries are saved in a line shapefile. The routine was written in VB using stand-alone computational geometry routines.

Contour Generation

Programming Skills	<ul style="list-style-type: none"> • Visual Basic • Algorithm/Mathematical/Geometry development
Description	A routine was developed to generate contours from a TIN at a user specified contour interval. The routine was developed in VB.