

DACUM Research Chart for Aerial Sensing Data Analyst

Produced for



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September 7-8, 2016

DUTIES TASKS

DUTIES	TASKS								
A. Plan Data Collection	A.1 Identify customer requirements (e.g., area of interest, GSD, type of data product)	A.2 Define geographic area of interest	A.3 Identify site restrictions (e.g., airspace, obstacles, equipment limitations)	A.4 Conduct site visit	A.5 Determine data collection equipment (e.g., aircraft, sensor, UAS GCS)	A.6 Schedule data collection date/time	A.7 Coordinate site logistics (e.g., local, government agencies, third parties)	A.8 Identify data collection workflow	A.9 Create initial flight plan
	A.10 Coordinate ground control requirements (e.g., number, location)								
B. Acquire Aerial Data	B.1 Assess environmental conditions (e.g., light, wind, terrain)	B.2 Manage sensor configuration (e.g., settings, calibration)	B.3 Verify flight plan	B.4 Verify ground control points	B.5 Monitor sensor operation	B.6 Manipulate sensor operation (e.g., surveillance, moveable payload, inspection)	B.7 Perform field assessment of captured data		
C. Manage Acquired Data	C.1 Transfer captured data from drone	C.2 Label captured data (e.g., customer, date, location)	C.3 Back up raw data	C.4 Eliminate redundant data	C.5 Extract geolocation data	C.6 Correlate geolocation data to sensor data	C.7 Verify data integrity (e.g., quality, plan, gaps, overlap)	C.8 Segregate customer data	C.9 Secure captured data (e.g., passwords, encryption, chain of custody)
	C.10 Execute data distribution plan								
D. Process Acquired Data	D.1 Identify processing workflow for data set	D.2 Estimate data processing time	D.3 Apply application-specific algorithms (e.g., stand count, NDVI, cleaning tools)	D.4 Trim data to area of interest	D.5 Digitize ground control points	D.6 Generate 3D data (e.g., point cloud, digital elevation models)	D.7 Generate ortho mosaics	D.8 Vectorize planimetric features	D.9 Classify point data
	D.10 Assess quality of processing outputs (e.g., reprojection error, camera calibration)	D.11 Edit data (e.g., seam lines, color balance)	D.12 Verify accuracy of model using checkpoints (e.g., 3D, ortho)	D.13 Identify data artifacts	D.14 Recommend re-flights as needed				
E. Produce Deliverable(s) for Customers	E.1 Review scope of work	E.2 Export 3D models	E.3 Create shape files	E.4 Generate topographic maps (e.g., contour lines, TIN)	E.5 Annotate data products	E.6 Compare historical data (e.g., change detection, NDVI)	E.7 Produce data processing reports	E.8 Convert file format to customer requirements	E.9 Compile metadata
	E.10 Generate actionable recommendations (e.g., change detection, prescription maps)	E.11 Prepare customer report	E.12 Assemble technical data package	E.13 Manage versioning control	E.14 Obtain sign-offs (e.g., professional certifications, supervisors)	E.15 Perform final QC of deliverables			

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Page 2

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F. Maintain Historical Data	F.1 Comply with data security policies (e.g., internal, client-specific)	F.2 Identify archive requirements	F.3 Assign data access rights	F.4 Archive project data (e.g., compressed files, correspondence)	F.5 Update searchable database	F.6 Retrieve archive data	F.7 Support marketing efforts with data		
G. Manage Technical Resources	G.1 Verify equipment maintenance compliance	G.2 Verify equipment condition	G.3 Provide equipment purchasing recommendations	G.4 Liaise with equipment vendors	G.5 Capture lessons learned	G.6 Recommend workflow improvements	G.7 Manage job queueing		
H. Maintain Professional Development	H.1 Train new aerial data analysts	H.2 Obtain licensure and certifications	H.3 Maintain licensure and proficiency	H.4 Participate in conferences and tradeshows	H.5 Write professional materials (e.g., whitepapers, articles)	H.6 Review professional publications	H.7 Participate in professional organizations	H.8 Participate in internal training	H.9 Apply lessons learned to workflows
	H.10 Attend vendor training (e.g., software, company)	H.11 Develop business acumen (e.g., finance, technical writing, business development)	H.12 Participate in research & development activities	H.13 Perform public outreach (e.g. workshops, community education)	H.14 Establish personal development plan	H.15 Participate in staff recruiting			

General Knowledge and Skills

Knowledge

FAA FAR
Sensor limits
Aircraft limits
Remote sensing
Data processing
Photogrammetry
Surveying methods
Map accuracy standards
Geodesy

Skills

Time management
Communication (written, oral)
Spatial orientation
Interpersonal
Problem solving
Analytical
Organizational
Prioritizing
Multitasking
Estimating
Computer/technical

Acronyms

QC Quality Control
QA Quality Assurance
AOI Area of Interest
GCS Ground Control Station
GSD Ground Sample Distance
NDVI Normalized Difference Vegetation Index
TIN Triangulated Irregular Network
UAS Unmanned Aerial System

Behaviors

Self-motivated
Team player
Dependable
Flexible
Professional
Detail-oriented
Analytical
Focused
Accurate
Able to follow directions
Responsible
Objective
Self-disciplined
Self-directed
Collaborative
Customer-oriented
Process-oriented
Critical of self
Forthcoming
Deadline-oriented

Tools, Equipment, Supplies and Materials

Computer Workstation

Software:

SOCET
ENVI
ESRI
AutoCAD
Trimble Business Center
Microsoft Office
Microstation
Pix 4D
Correlator 3D
Photscan
MENCi
QGIS
Global Mapper
Google Earth Pro
Flight control software
Foreflight
Flight planning software
Database software
Photoshop
Calibration software

Drones

Sensor/payload

Base station

Survey ground control

Ground control points

Surveying equipment

Laser range finder

Calibration panels

Ruggedized hard drives

Ruggedized laptop

Generator / inverter

WIFI hotspot

Internet / Intranet

Air band radio

Spectrum analyzer

Future Trends and Concerns

Rapidly changing technology
Automation of tasks
Emerging aircraft, sensor, & processing technologies
Nanoization of sensors
Loss of fundamental scientific understanding
Changing power sources and batteries
Growing volumes of data to process
Processing power
Encryption and cybersecurity
Upkeep of training
Job obsolescence supply and demand
Liability and insurance
Unlicensed persons doing work requiring licensure
Growing government regulations
Public perception of UAS
Big data analytics
Hesitancy/failure to adopt UAS technology