

CDI FY18 Request for Proposals

SfM / Photogrammetry Processing Pipeline on USGS HPC

Submission Title: SfM / Photogrammetry Processing Pipeline on USGS HPC

Lead PI: Joe Adams

Mission Area: Climate and Land-Use Change

Region: Southwest Region

Organization: Geosciences and Environmental Change Science Center

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City: Denver

State: CO

Co-PIs and Collaborators:

Type: Collaborator

Name: Christopher Sherwood

Mission Area: Natural Hazards

Region: Northeast Region

Organization: Woods Hole Coastal and Marine Science Center

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City: Woods Hole

State: MA

Type: Collaborator

Name: Andrew Ritchie

Mission Area: Natural Hazards

Region: Pacific Region

Organization: Pacific Coastal and Marine Science Center

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City: Santa Cruz

State: CA

Type: Collaborator

Name: Gary Motz

Mission Area: Not Applicable

Region: Midwest Region

Organization: Indiana University

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State: IN

Type: Collaborator

Name: Jonathan Warrick

Mission Area: Natural Hazards

Region: Pacific Region

Organization: Pacific Coastal and Marine Science Center

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City: Santa Cruz

State: CA

Science Support Framework Element 1: Science Data Lifecycle - Processing

Science Support Framework Element 2: Data Management

Science Support Framework Element 3: Communities of Practice

In-Kind Match: \$14,930.00

List of anticipated deliverables from the project: Presentations. A repository of existing documentation and tools for building a processing pipeline. PhotoScan licenses for Yeti.

Lead Cost Center: GGCMRL0000 (GECSC)

Project Description: Bring together workflows and tools developed at several USGS offices, other agencies, and university to build a photogrammetry processing pipeline on USGS HPC Yeti system. The bulk of this funding will purchase AgiSoft PhotoScan license to run on Yeti and be available to all USGS and collaborator HPC users.

Total Budget: \$36,266.00

USGS CDI 2018 RFP
Statement of Interest

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Project PI: Joe Adams, USGS UAS Project Office

Several USGS offices and projects have developed workflows and scripts to ease the frustrations of Structure from Motion (SfM), i.e. photogrammetry, processing. These frustrations include managing thousands of images and logs, processing time, and consistently producing quality output products with metadata. This project will be a forum for sharing existing experiences and tools and collaborating on molding these into an HPC photogrammetry pipeline that improves productivity, reduces response time, and outputs high quality, consistent, data products rapidly into existing distribution systems such as Earth Explorer, HDDS, and ScienceBase.

Funding this CDI proposal will provide a full and permanent set of software licenses on USGS Yeti HPC that can be utilized by all USGS and collaborator HPC and photogrammetry users. Scientists have been intermittently running photogrammetry processing on Yeti using temporary and borrowed Agisoft PhotoScan licenses. The lack of dedicated, official, Yeti PhotoScan licenses has hampered productivity and consistent photogrammetry processing on Yeti. No single project has had sufficient funding to purchase all necessary software licenses to fully utilize Yeti for photogrammetry processing. Funding this proposal will eliminate the distraction of software licensing allowing contributors to focus on refining workflows and merge existing tools into an HPC photogrammetry pipeline.

This project will fund collaboration with the Indiana University Advanced Visualization Laboratory and the Indiana Geological & Water Survey Division of Information Services in sharing their existing knowledge and HPC photogrammetry pipeline they have created for automating 3D digitization, processing, and distribution of artifacts and fossils in IU collections. The fertile networking environment of ESIP created this collaboration opportunity. A glimpse of future outcomes from this collaboration can be seen in this SketchFab Collection:

<https://sketchfab.com/garymotz/collections/iu-paleontology>

This project will use knowledge and results of past CDI funded projects such as “Portable ISO 19115/19110 Open Source Developer’s Toolkit” (2014) and “Making UAS Data Available to USGS Scientists and the Public” (2015).

USGS offices and other agencies and groups that have pledged support and collaboration on this project include Pacific Coastal and Marine Science Center, Woods Hole Coastal and Marine Science Center, Cascades Volcano Observatory, Geology, Minerals, Energy, and Geophysics Science Center, Arizona Water Science Center, ESIP Drone Cluster, BLM NOC Remote Sensing Office, and DOI Office of Aviation Services UAS Office.

Estimated Budget - On page 2.

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Estimated Budget

Budget Category	Federal Funding "Requested"	Matching Funds "Proposed"
1. PERSONNEL (SALARIES including benefits):		
Federal Personnel Total:		\$10,500
Approx 20 hours of time from each collaborating government office x 7 offices @ \$75 / hour		
Indiana University Personnel Total:	\$3,500	
Total Salaries:	\$3,500	\$10,500
2. TRAVEL EXPENSES:		
Travel Total (Per Diem, Airfare, Mileage/Shuttle) x # of Trips:		
Joe Adams attend ESIP Summer Meeting		\$1,800
Gary Motz (IU) attend ESIP Summer Meeting		\$1,800
Joe and Gary ESIP Registration Fees (\$415 x 2)		\$830
Total Travel Expenses:		\$4,430
3. OTHER DIRECT COSTS: (itemized)		
Equipment (PhotoScan licenses for Yeti - \$3,500 x 7):	\$24,500	
Publication Costs:		
Office Supplies, Training, Other Expenses (specify):		
Total Other Direct Costs:	\$24,500	
Total Direct Costs:	\$28,000	
Indirect Costs - USGS GECSC Admin - 29.52%:	\$8,266	
GRAND TOTAL:	\$36,266	\$14,930