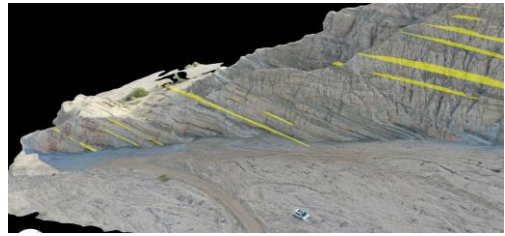# DUE-1839705, Integrating Cognitive Science and Intelligent Systems to Enhance Geoscience Practice

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The project aims to support geology field work by developing autonomous vehicles to collect data on 3D features and develop protocols to record uncertainty in data and models.

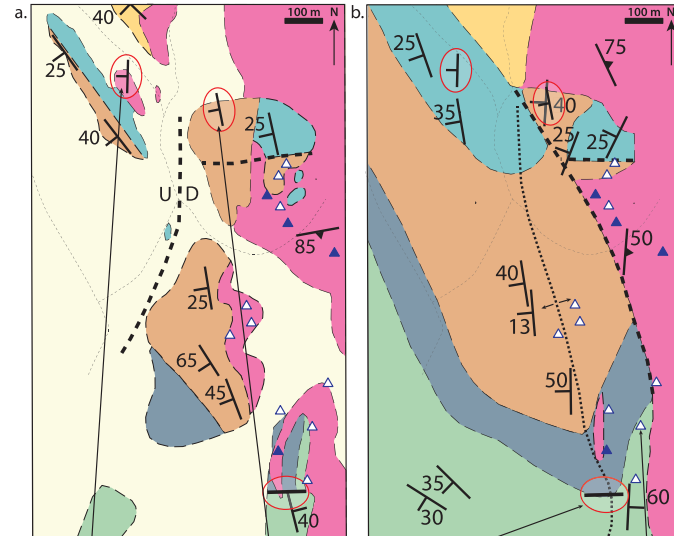## Training sedimentary layers recognition using citizen science.

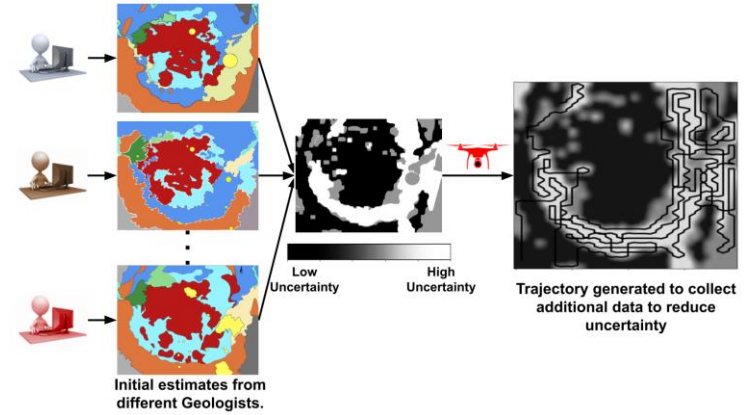### People agree on bedding planes

Some challenges

Recording uncertainty in field data for transparency and collaboration.

	SHF152A	SHF165A	SHF 81	SHF103A
	Lower Deep Springs Formation	*Middle Deep Springs Formation*	*Campito Formation*	*Sage Hen Flat Granite*
Lithology	1/5	4/5	3/5	5/5
Attachedness	3/5	4/5	4/5	1/5
Geometry	2/5	3/5	3/5	N/A
Strike & Dip	176/60 W	170/62 W	013/39 E	N/A

Planning to reduce uncertainty

Initial estimates from different Geologists.

Trajectory generated to collect additional data to reduce uncertainty

Data fusion in the natural world.

Lidar Data

Static undistorted point cloud from Ouster OS1 lidar with rgb data painted from 3 camera set. Bright pink areas correspond to points in regions of non-overlap between the three cameras. Each camera runs an individual auto exposure loop to ensure apriltag detection under lighting condition changes. The inevitable result of this choice is the large color variation throughout a single scan and the resulting muddiness when subsequent scans are composed (in a future slide).