

Spatial Data Science & Analytics

Lebogang Mashishi – Product Lead

Liezel Botha – Technology Leader



THE SOUTHERN AFRICA ESRI USER CONFERENCE 2023

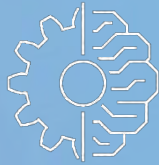
Spatial Data Science Framework



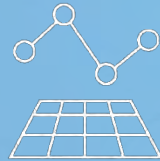
Data
Engineering



Visualization
&
Exploration



Machine
Learning & AI



Spatial
Analysis



Big Data
Analytics



Modeling
& Scripting



Sharing
&
Collaboration

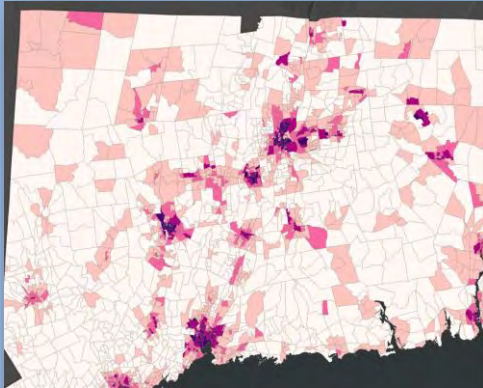
Agenda

- Data Engineering
- Spatial Analysis
- Modelling & Scripting
- GeoAI
- Sharing & Collaboration

1. Predictive Analytics

Prepare Data, Make Predictions, Find Correlations, Understand Top Variables, and More

Predicting asthma rates



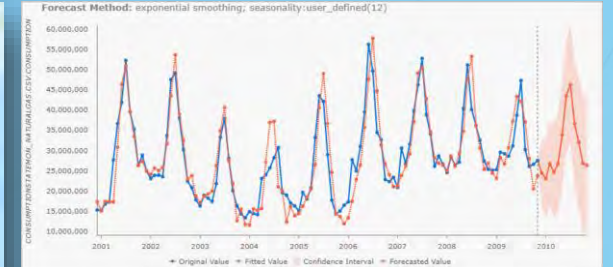
Predicting house pricing



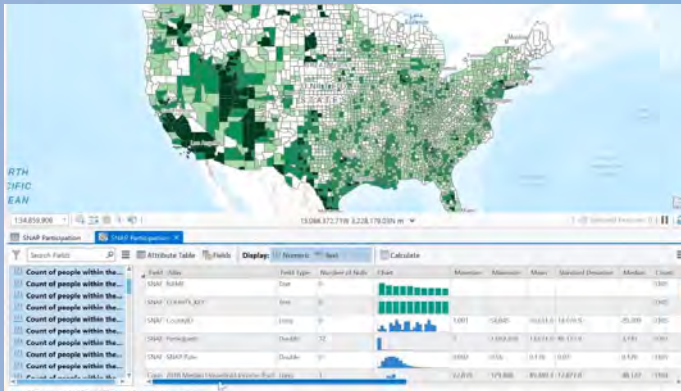
Predicting sea habitat



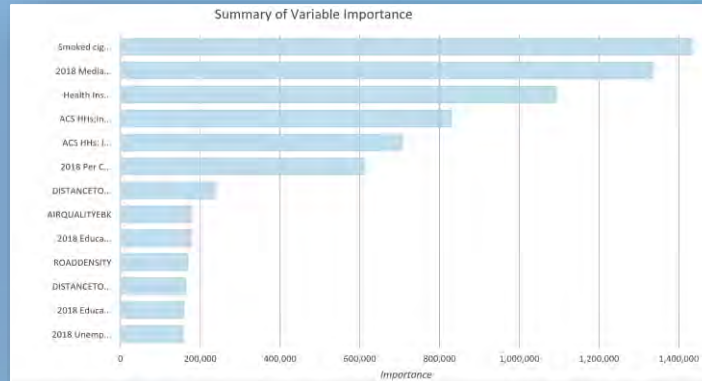
Time series forecasting



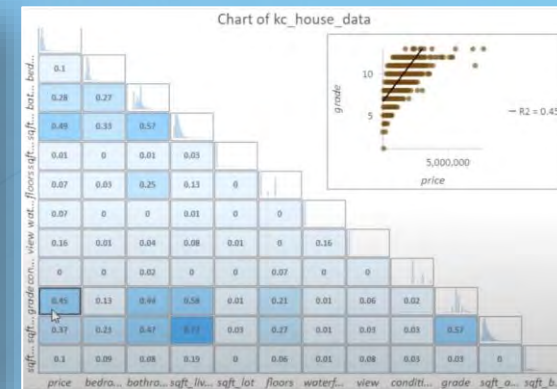
Data engineering



Variable importance

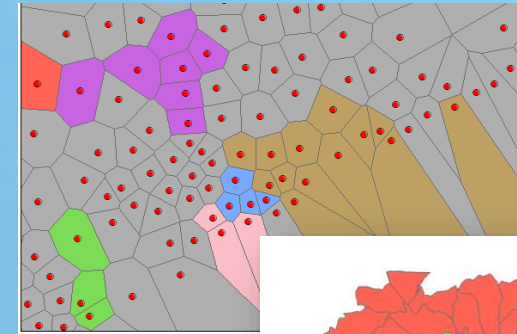
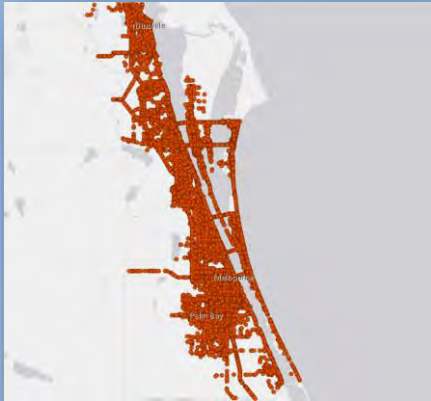


Variable correlation

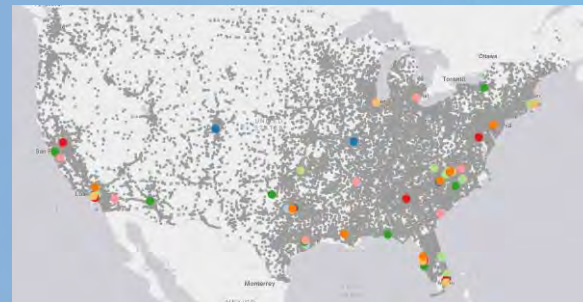
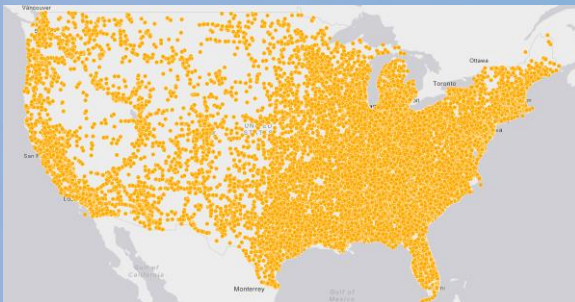


2. Pattern Mining and Clustering

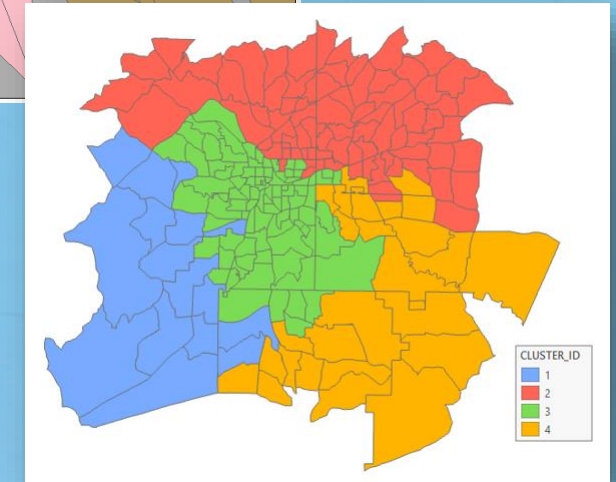
Understand Natural Groupings in Data That Are Statistically Significant



Emerging and fading hotspots for Crashes using **SpaceTime Pattern Mining Toolbox**



Most important fatal crashes clusters using **Density Based Clustering (DBScan)**

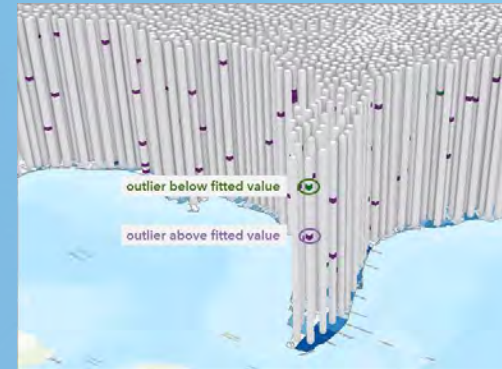


Find spatially contiguous clusters for animal territories using **Spatially Constrained Multivariate Clustering**

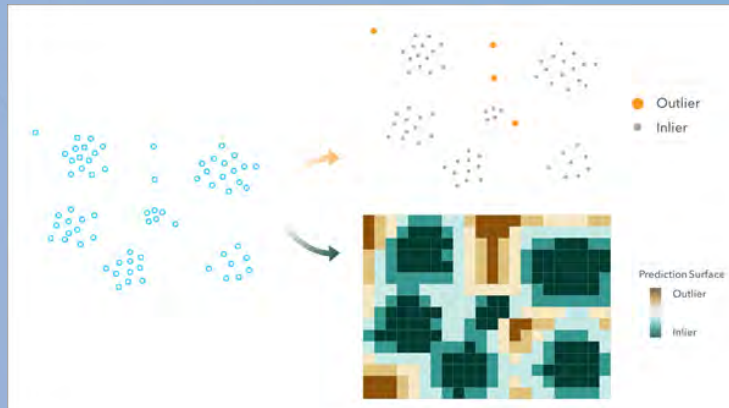
3. Anomaly Detection

Spatial, Temporal, and Spatiotemporal Outliers

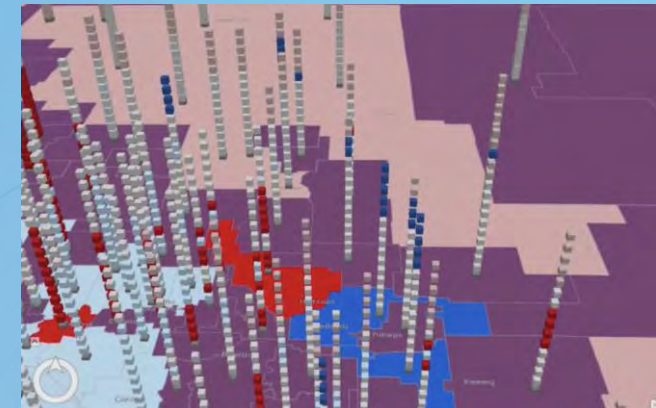
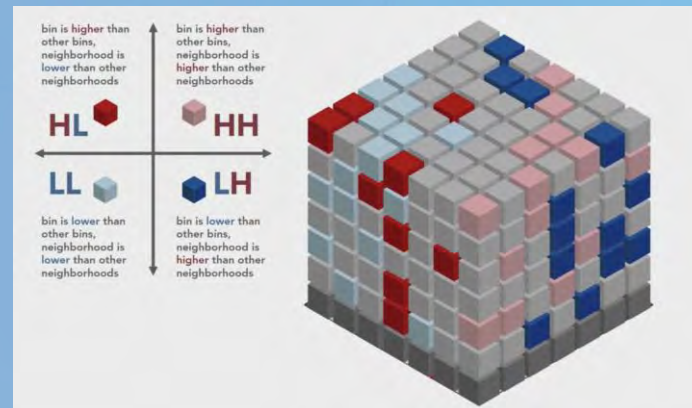
Time series outliers (temporal)



Spatial outliers (spatial)



Local outlier analysis (spatiotemporal)



4. Object Detection, Pixel Classification, Object Classification, Tracking, and More

Damaged structures



Building footprints



Land cover



Pipeline encroachment



Palm trees



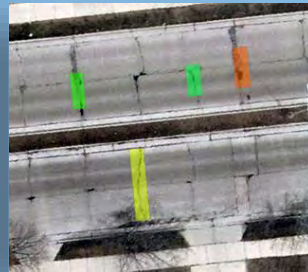
Roads



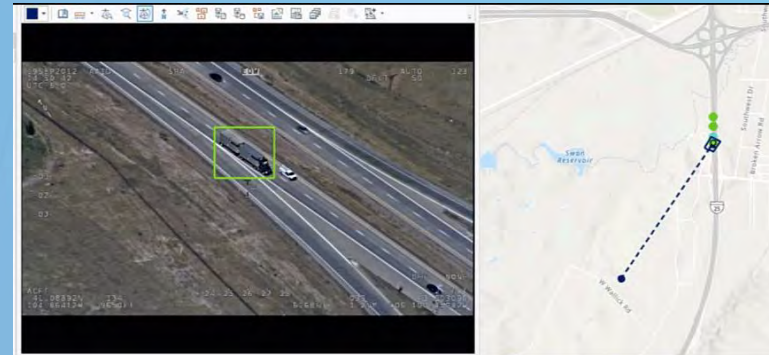
Oil pads



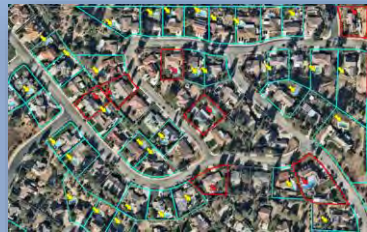
Road cracks



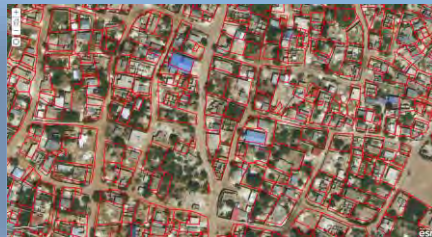
Tracking in FMV



Swimming pools



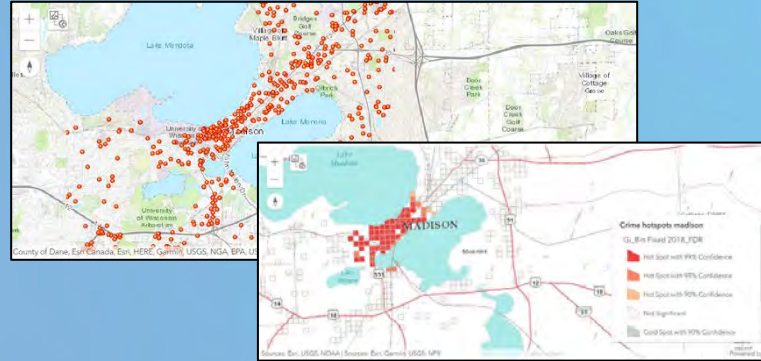
Parcel (edge) detection



5. Extract Insights from Unstructured Text

Extract Entities, Classify Text, Translate StoryMaps, and More

Extracting entities and relationships from text reports



Classifying country of incomplete addresses

Address	Country
40, Rue Eugene Delacroix, Seloncourt, 25230	FR
736, E AMOROSO PL, 90291	US
15127, CALLE EDGAR ALÁN POE, CHIHUAHUA, Chihuahua, Chihuahua	MX
25376, COSTEAU ST, LAGUNA HILLS, CA	US
1-6, 一乗寺堀 / 内町	JP
3701-1, 飯香浦町	JP
30, CL CARMEN AMAYA, 39011	ES
NW21-17-23W	CA
8140, avenue Belges	CA
80, WURUNDJERI BOULEVARD, BERWICK, VIC, 3806	AU

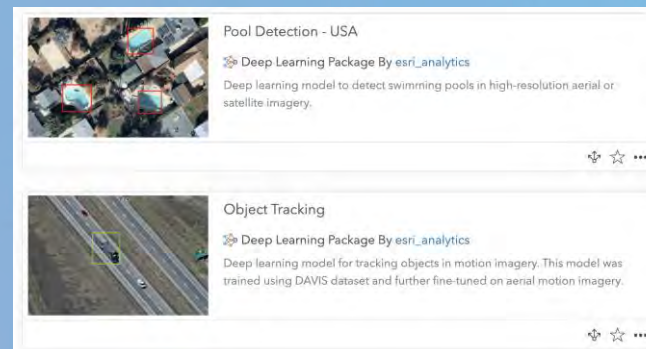
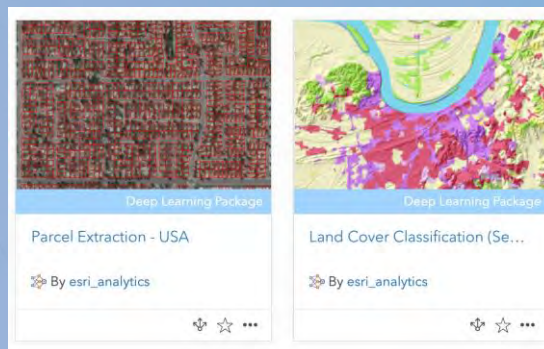
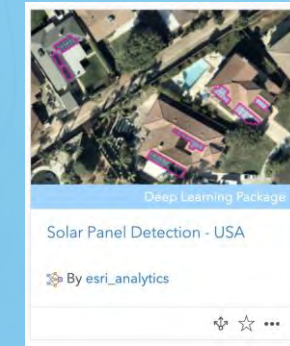
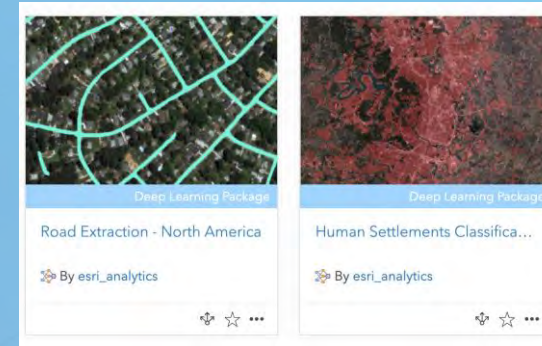
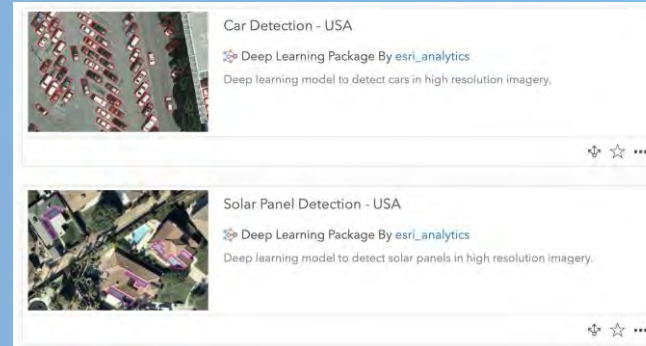
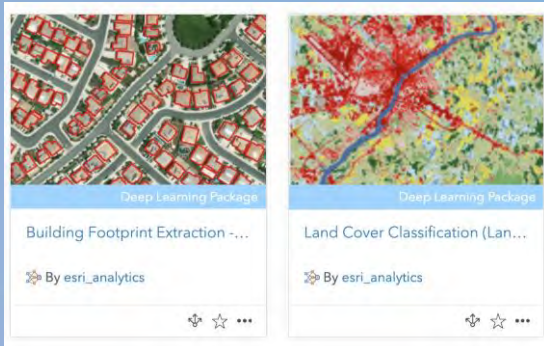
Translate StoryMaps

Correct and normalize mistyped street addresses

MISTYPED NON-STANDARD ADDRESS	NORMALIZED ADDRESS
940, NORTH PENNSYLVANIA AVNEUE, MASON ICTY, IOWA 50401	940, N PENNSYLVANIA AVE, MASON CITY, IA 50401
220, SOYTH RHODEISLAND AVENUE, MASON CITY, IOWA 50401	220, S RHODE ISLAND AVE, MASON CITY, IA 50401

Pre-trained Models on ArcGIS Living Atlas

Plug-and-Play Models. No Training Needed. Easy Re-training Using Local Data.



Use Models Within

- ArcGIS Pro (+ Image Analyst Extension)
- ArcGIS Enterprise (+ Image Server)
- ArcGIS Online (+ ArcGIS Image)

Let's get started

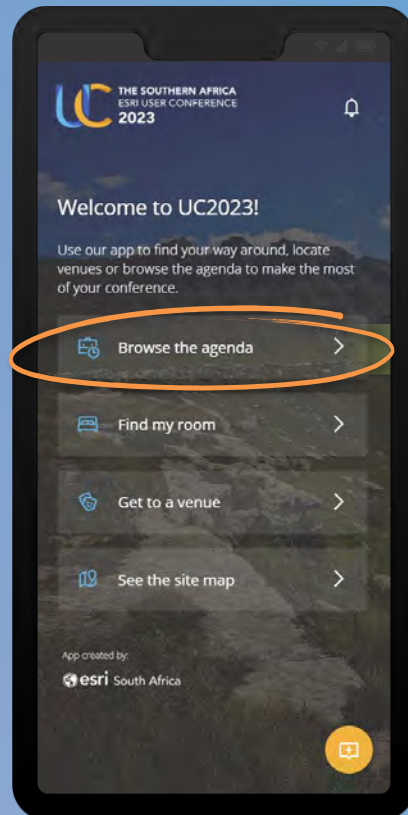
Accessibility to Public Health



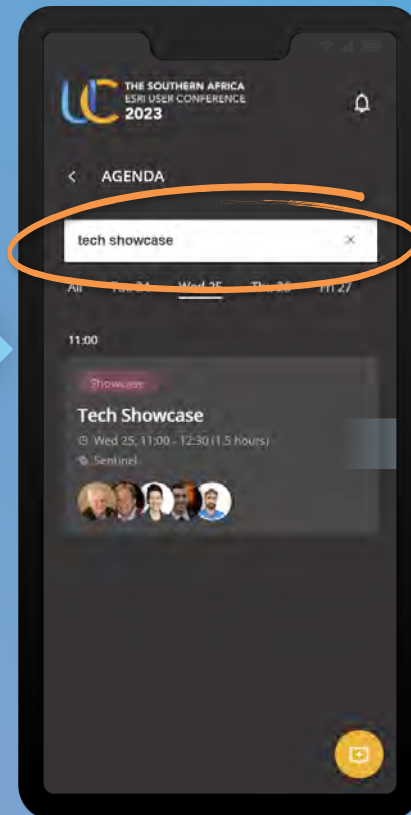
Please share your feedback in the UC2023 app



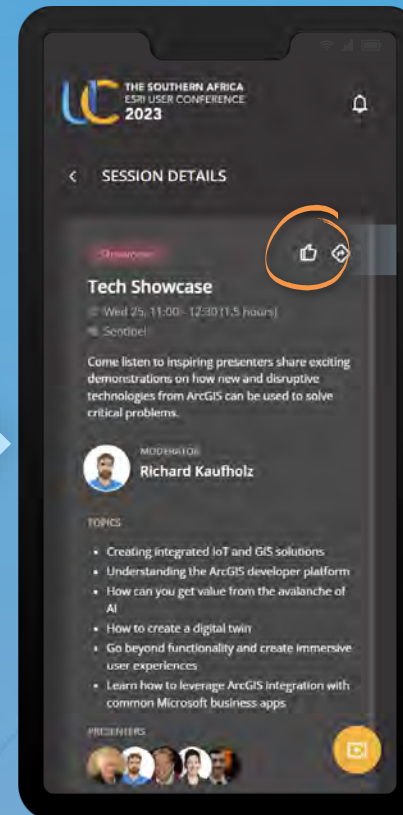
Open
uc2023.esri-southafrica.com
and browse the agenda



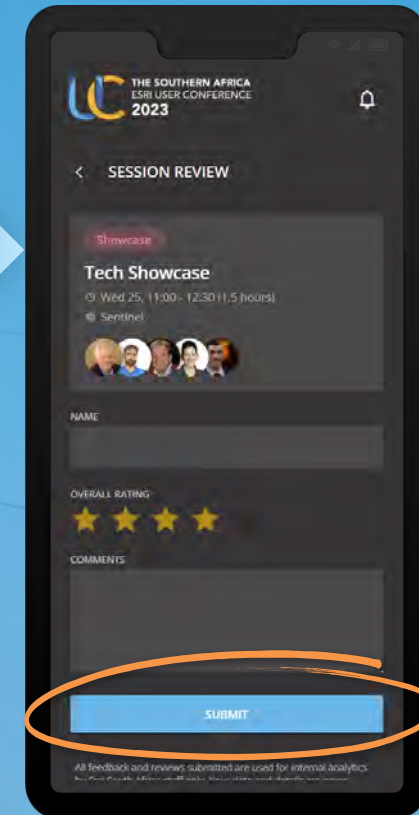
Search and select the
session you attended



Click the “thumbs up”
icon



Complete and submit
your review





**THE SOUTHERN AFRICA
ESRI USER CONFERENCE
2023**

CONNECTING COMMUNITIES