Bericht von den Konferenzen

Matthias Schenker
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ArcGIS is available as both an online Mapping & Location platform as well as a comprehensive GIS.

ArcGIS includes all aspects of Mapping and Location.
Mapping (2D & 3D) | Integrating Cartographic Intelligence

New and Improved
- Clustering
- Performance (WebGL)
- Dynamic Analytics
- 3D Everywhere

Works with Your Data in a Browser
WebGIS | JS API - Built for the Modern Web

Smart Mapping: Data Driven Visualization

WebGL Performance

3D Measurement

Surfaces, Objects, & Massive Point Clouds

Directions

3D Visualization and Analytics

Widgets and Tools

Drawing Tools

Subsurface

Arcade Display Language

Mobile Web

Powerful Web Map Specification

Interactive Analysis

...Immersive, Interactive, and analytic
Demos

Field Mobility | Empowering Mobile Workers

Apps for the Field

- Explorer
- Workforce
- Navigator
- Collector
- Survey123

Features:
- Collecting Data
- Coordinating Work
- Advanced Navigation
- Mapping and Markup

Connected and Disconnected

New

Markup
ArcGIS Pro – A Comprehensive Desktop GIS
Partnering to Bring Together BIM & GIS
Make Anything with The Science of Where

... Imagine, Plan, Design, Build and Manage a Better World
Designing with Nature
Requires an Integrated and Holistic Approach

Geography Provides the Common Language for Collaborating

Context
- Landscape Information Models
- City Information Models
- Building Information Models

Content
Integrating BIM and GIS Workflows
Driving Business with Smarter Decisions

GIS DATA
- Master Planning
- Regulation & Permitting
- Revenue Generation
- Monitoring & Enforcement
- Capital Portfolios

BIM DATA
- Preliminary Design & Plan
- Detailed Design
- Construction
- Preconstruction
- Capital Projects

GIS
- Services
Esri & Autodesk Vision
Integration

Interoperability

ArcGIS Enterprise / Online

JavaScript/
Web
AppBuilder

ArcGIS Pro

Autodesk AEC Collection
InfraWorks
Revit
Civil 3D
AutoCAD

Autodesk BIM 360
## ArcGIS Pro Roadmap

### Near-term
- Metadata (Import, Export and Sharing)
- Reports
- Full motion video
- Real time streaming
- Offset printing
- Interactive Slice Tool
- Scene Layer Editing
- Revit File Support
- Attribute Rule enhancements
- Spell Check
- Batch Geoprocessing
- Data Clock Chart

### Mid-term
- Parcel Management
- Presentations
- Dynamic Feature Binning and Clustering
- Projects in the Enterprise
- Animated symbols
- Dimensions
- Materials
- 3D Effects
- GPS Support
- Terrain Editing
- Trend Profile Chart
- New Extensions

### Long-term
- Multidimensional scientific data exploration
- Physically based rendering
- Geoprocessing in the database
- Distributed desktop processing using Spark
- ...
The 3 Stages of Data Science

DATA PREPARATION

Pro is a Complete Data Science Workstation

ANA L Y S I S

Python Notebooks

DISSEMINATION

Analytic Engines

Pro & ArcPy

Pro & ArcPy

Pro & ArcPy

Pro & ArcPy

Pro & ArcPy
Machine Learning and Spatial Data Science

Providing Rich Geospatial Contextual Information

Adding Explanatory Variables to Predictive Analytics
Artificial Intelligence

Machine Learning

Deep Learning
Use ArcGIS with Machine Learning to Predict Accident Probability Per Hour per Segment in Utah
What would Cause an Accident?

- Temperature
  - Sun, Mon, Fri..
- Wind Speed
  - Fast, Slow..
- Visibility
  - High/Low
- Snow Depth
  - High/Low
- Day of the Week
  - Sun, Mon, Fri..
- Time of the Day
  - 12:45, 23:00
- Month
  - Feb, Dec..
- Road Alignment
  - Straight / Curved
- Proximity to Intersections
- Speed Limit
  - 120 km/h
- Sun Direction
  - East, West
- Daily Traffic
  - AADT
- Proximity to Billboards

10s of Variables
- 7 Years of Data
- 400,000 Accidents
- 500,000 Segments

Impossible to Manually Analyze

Train a Machine to do?
GeoAI Project Lifecycle

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
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<tbody>
<tr>
<td>Spatial Data Exploration</td>
<td>How is the Data distributed Spatially? Any Spatial Patterns of interest?</td>
</tr>
<tr>
<td>Spatial Data Preparation</td>
<td>Example: Snapping Car Crashes to Road Links, Geo-enrichment</td>
</tr>
<tr>
<td>Spatial Feature Extraction</td>
<td>Example: Road Curvature, Number of Lanes, Proximity to Crossroads</td>
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<tr>
<td>Feature Engineering</td>
<td>Exploring Input Feature Correlation with the Output Feature. Feature Selection Techniques</td>
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<tr>
<td>Model Development</td>
<td>Iterating with different Models. Choosing Models per Metric of choice (e.g. RMSE)</td>
</tr>
<tr>
<td>Spatial Action Facilitation</td>
<td>Facilitating Post-Prediction Actions. E.g.: Optimizing Ambulance Allocation based on Crash Prediction</td>
</tr>
</tbody>
</table>
ArcGIS has well defined capabilities that work synergistically together.

ArcGIS Enterprise includes all capabilities.

ArcGIS Online / SaaS includes capabilities in yellow.

Experience, Apps, APIs

- Field Mobility
- Location Analytics
- Mapping & Visualization
- Data
- Content
- Advanced Geo-Information Models
- Imagery
- Manage, Exploit, Disseminate
- IoT
- Real Time Observations, Monitoring, Analysis
- ...