Fieldguide: Building Communities Through Image Recognition AI

Andre Poremski & Taylan Pince (Fieldguide) | Lindsie McCabe & Neil S. Cobb (Northern Arizona University, SCAN/LepNet)
Fieldguide provides a suite of functions that integrates a deep learning neural network to aid in biodiversity identification.
Computer Vision
Identification of Lepidoptera

Fieldguide → LepSnap → NSF-ADBC Thematic Network

Non-Profit Company

NSF-ADBC Thematic Network
A family of apps for identifying and cataloging flora & fauna
A machine learning platform that provides an image recognition API to third-party applications.
One of the world's largest and most accurate neural nets for biodiversity research
A massive database of annotated and geo-referenced images of plants, animals, and anatomy/morphology
Who is Fieldguide for?
Fieldguide connects people based on interest & expertise: “the knowledge network”
Fieldguide in the Ecosystem of Image Recognition

**Google Lens**
- General look-up
- Incredible OCR
- Especially useful for product discovery

**Visipedia**
- For developers
- CV toolkits
- Products & nature
Fieldguide in the Ecosystem of Image Recognition Tools

- **Google Lens**
- **Visipedia**

**Scores of specific organismal “Computer Vision” projects**
- Bumblebees
- Parasites
- Plants etc.

**iNaturalist**
- Citizen scientists
- Field observations
- Flora & fauna

**Fieldguide**
- Citizen scientists & museums
- Field observations & specimens
- Flora & fauna
What does Fg offer, more specifically?
Data

Fieldguide is building and learning fast...

- >2 million public reference images
- >50,000 species represented
- >50 museums and >700 authors
- Currently training on 1 million images per day
- Will train on >100 million images in 2018
NET

FgNet is a “super net”

- FgNet can scale to >1M classes
- Can perform highly fine-grained IDs
- Accurate as specialty nets, faster at scale
- Scalability reduces CV fragmentation
- Neural nets only as good as the data
What if it’s misidentified?

- There will always be errors 😢
- Fg relies on people: experts & amateurs
- Add more accurate data vs fixing errors
- “FgBot” is an automated data janitor
- Experts can customize their “review queue”
APPs

Proof of Concept: Leps by Fieldguide

• Trained on >2M moth/butterfly images
• >84% accurate on North American leps
• On pace to reach >70% on worldwide ssp
• Integrated with Symbiota & iNaturalist
• On iPhone, Android & LepSnap.org
APPS

Beyond Leps: Main & Specialty

- Specialty apps are filtered views of Fg proper
- All apps use the same neural network
- Single user account accesses everything
- Create “custom guides” on Fg proper
- Launches July 2018 on all platforms

hello@fieldguide.net
Biodiversity Mapping with stand-alone citizen science projects
API

How do museums use the Fieldguide API?

- Use phone app to photograph specimens and publish directly to Symbiota
- Screen material from expeditions for initial curation
- As a check on human identifications of existing material (FgBatch)
- As a visual search widget for look-up and streamlined publishing (FgSearch)
- API is RESTful and standards-compliant, public documentation in progress
API

FgBatch is a free AI-powered tool
Future Focus (2018-2019)

1. Incorporating geographic & phenological filters
2. Integrating multiple images into decision process
3. Expand anatomy/morphology images
   (e.g., genitalia)

Say hello@fieldguide.net