Job Description

Software Engineer - UI/UX for Machine Learning

Portland, Oregon

Job summary: We are looking for a candidate who is interested in developing cutting edge solutions utilizing the latest front end development technologies to translate machine learning workflows and results to easy-to-understand displays for wildlife biologists. This position requires a candidate who can learn quickly and is comfortable working with evolving software and requirements on a small team focused on advanced software for wildlife conservation.

Essential Duties And Responsibilities

- *Collaborate with Wild Me team members and project stakeholders (e.g., field biologists and customers) to scope, develop and deliver world-class scalable software solutions.*
- *Use good analytical and technical problem solving skills to develop and deliver software solutions that effectively translate the nuances of machine learning to biologists*
- *Research cutting-edge technologies and novel technical solutions to help improve our applications and services.*
- *Maintain a basic curiosity about wildlife conservation*
- *Work independently with minimal supervision while maintaining active participation within the team*
- *Demonstrate honesty, responsibility, integrity and fulfillment of commitments*

Qualifications

- *At least three years of professional experience writing production level software*
- *High-level skills with Javascript, HTML5, and CSS. Java a plus.*
- *Familiarity with Sass or Less*
- *Familiarity with tools such as Grunt, Gulp, Bower, Git*
- *Experience with Restful APIs and data manipulation with JSON*
- *Passionate about pixel level detail and smooth UI interactions*
- *Proven experience and high tolerance for ambiguity working through product incubation to final release*
- *Ability to stay resilient in the face of new hardware or software challenges*

- *Solid written and oral communication skills*
- *This role requires ability to travel nationally and internationally about 10%*
- *Education/experience/certifications*
- *Bachelor's degree (B.A. or B.S.) in computer sciences, computer engineering, electrical engineering or related field from accredited institution and 3 plus year's relevant experience, OR equivalent combination of education and experience.*

You get bonus points for:

- Foreign language skills
- Experience working with international customers
- Software i18n and l10n experience
- Proven experience in wildlife conservation projects
- Experience with cloud services (e.g., Azure)
- Experience with crowdsourced data collection and citizen science activities
- Experience building systems at scale
- Experience building web services (JavaScript, Java, HTML, etc.)
- Willingness to help teach others, including volunteers and Wild Me engineering staff

Expectations:

- Work in an open, highly collaborative environment.
- Show enthusiasm for research and application in machine learning, helping us bring machine learning at scale to wildlife biologists across the globe.
- Cross-train in and integrate with Wild Me's existing identification and detection pipeline https://cthulhu.dyn.wildme.io/public/posters/parham_wacv_2018.pdf
- Write funding proposals and attend meetings with clients that expect a high degree of competency
- Move to Portland, OR to work in-person at Wild Me's office

About Wild Me

As the price of photography and video equipment drops while quality and availability improve (think mobile phones and "GoPro"), images and video from tourism are becoming the most abundant and inexpensive sources of wildlife data. If these images could be widely obtained, rapidly analyzed and combined with related data (e.g., location, date, behavior), then scientists and conservation managers could benefit from larger and broader data sets. An increase in well managed data enables advances in analysis and modeling of animal populations, supporting deeper insight and better methods of protection for endangered animals; this, simply put, allows quicker and more efficient action in regard to wildlife protection.

WILD ME

Wild Me (www.wildme.org) — a 501(c)(3) non-profit organization focused on wildlife conservation — is uniquely comprised of IT professionals and computer scientists, advised by preeminent wildlife biologists. Wild Me has developed the Wildbook platform (see wildbook.org) to help scientists organize wildlife research, collect data from the public (e.g., photos and video), and integrate advanced artificial intelligence to speed data curation. Wildbook takes advantage of tourism and the growing “citizen scientist” movement, bringing the concepts of broad sector inclusion and “Big Data” to wildlife conservation. Data from scientists and citizen scientists in Wildbook lets researchers determine population sizes faster and then adjust ecological policies more quickly with greater accuracy and higher precision. A great example is the Great Grevy’s Rally (http://www.greatgrevysrally.com/), which helps ecologists like Professor Dan Rubenstein of Princeton University utilize photos from the public to count Grevy’s zebras in Kenya.

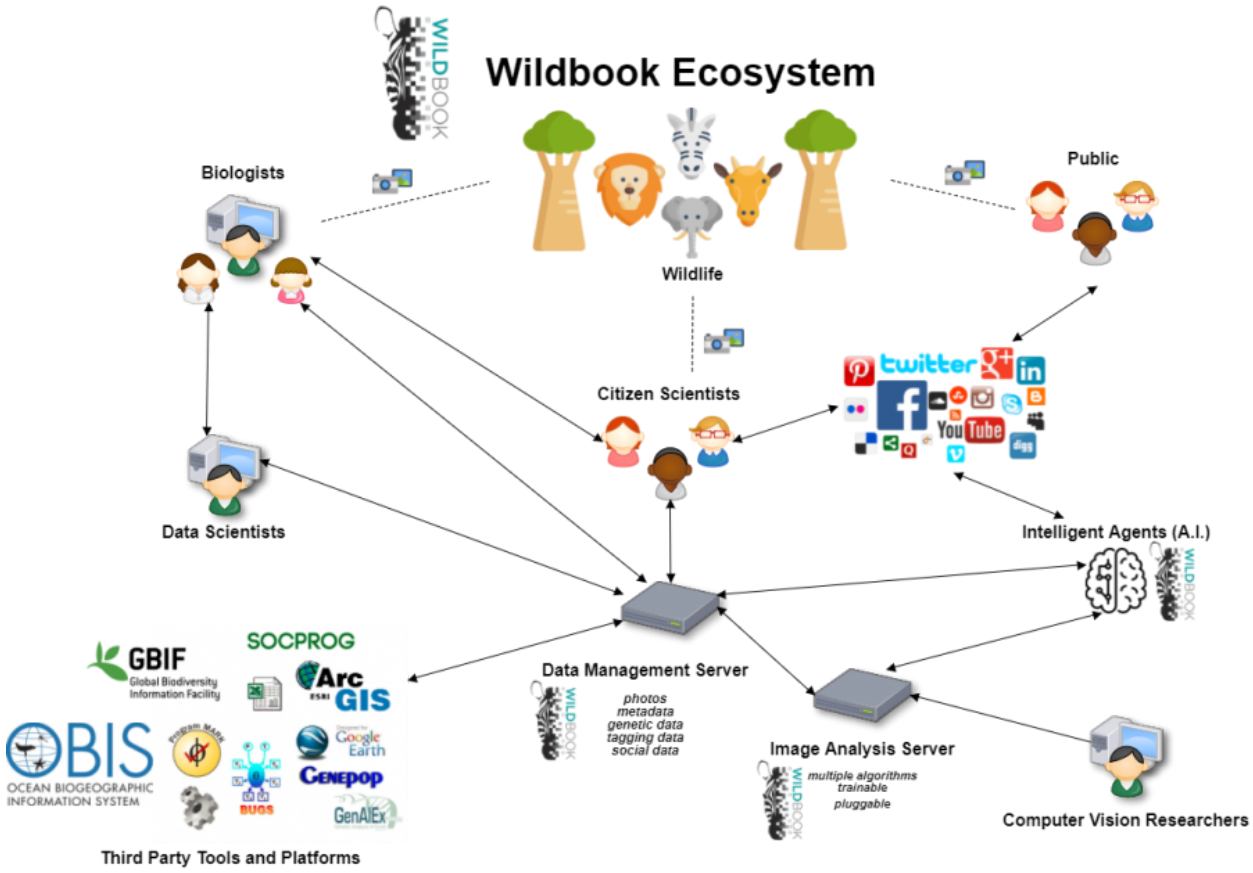

Figure 1a. The Wildbook Ecosystem of Scientists, Citizen Scientists, and A.I.

Integrating Artificial Intelligence with Data Management

Wildbook includes a two-part, multi-species computer vision pipeline to find and identify individual animals in photos collected under real-world conditions, especially with citizen science contribution.

Detection

Our detection pipeline is a cascade of deep convolutional neural networks (DCNNs) that applies a fully-connected classifier on extracted features. Three separate networks produce: (1) whole-scene classifications looking for specific species of animals in the photograph, (2) object annotation bounding box localizations, and (3) the viewpoint, quality, and final species classifications for the candidate bounding boxes.

Figure 1b. A sperm whale (Physeter macrocephalus) fluke is detected automatically with machine learning in Flukebook.

Identification

The second major computer vision step is identification, which assigns a name label to each annotation from detection. To do this, multiple algorithms and machine learning models may be employed. Scores from the query that match the same individual are accumulated to produce a single potential score for each animal. The animals in the database are then ranked by their accumulated scores. A post-processing step spatially verifies the descriptor matches and then re-scores and re-ranks the database individuals.

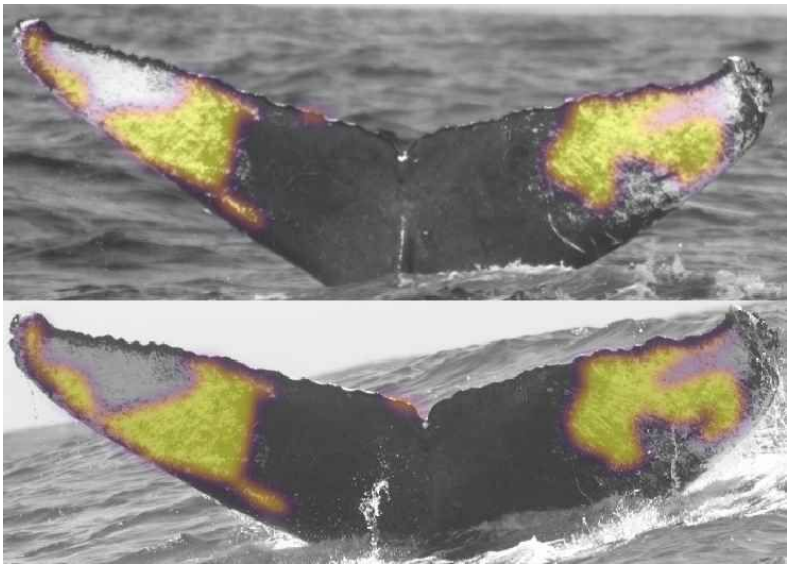

Figure 1c. A humpback whale (Megaptera novaeangliae) fluke is matched using a comparison of white and black contrast of its fluke in Flukebook. Wildbook provides multiple techniques for matching several species using an automated computer vision pipeline.