**DIGITAL NATURALIST-AI ENABLED TOOL FOR BIODIVERSITY RESEARCHERS**

**INTRODUCTION**

The increasing availability of digital images, coupled with sophisticated [artificial intelligence](https://www.sciencedirect.com/topics/computer-science/artificial-intelligence) (AI) techniques for [image classification](https://www.sciencedirect.com/topics/computer-science/image-classification), presents an exciting opportunity for biodiversity researchers to create new datasets of species observations. We investigated whether an AI plant species [classifier](https://www.sciencedirect.com/topics/computer-science/classification-machine-learning) could extract previously unexploited biodiversity data from social media photos (Flickr). We found over 60,000 geolocated images tagged with the keyword “flower” across an urban and rural location in the UK and classified these using AI, reviewing these identifications and assessing the representativeness of images. Images were predominantly biodiversity focused, showing single species. Non-native garden plants dominated, particularly in the urban setting. The AI classifier performed best when photos were focused on single native species in wild situations but also performed well at higher taxonomic levels (genus and family), even when images substantially deviated from this. We present a checklist of questions that should be considered when undertaking a similar analysis. The ever-growing number of digital sensors in the environment has led to an increase in the amount of digital data being generated. This includes data from satellites, weather stations, data from ‘‘internet of things’’ devices, and data collected by members of the public via smartphone applications, to name but a few. These new sources of data have contributed to the era of ‘‘Big Data’’ characterized by large volumes of data, of numerous types and quality, being generated at an increasing speed.1 This presents challenges and opportunities across a number of domains, including water management,2 camera trapping,3 and acoustic4 analysis. To process these data into useful information there are many tools available, including classical statistical analyses5 and classification by citizen scientists.6 However, at some point traditional approaches may become inefficient or even impossible given the volume, diversity, and heterogeneity of these data. Storage, exploration, curation, and revision of data may have to be re-thought to allow for their quick and efficient transformation, annotation, or analysis.

**LITERATURE SURVEY**

Here, we will take a look at all the previous solutions, attempts and implementations to the digital naturalist application or anything that is at least vaguely related to it.

**EXISTING SOLUTIONS**

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| **S.NO** | **Paper Title** | **Author(s)** | **Methods/Implementaion**  **Technique(s)** | **Reference Link** | |
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| 1. | Digital Naturalism: Interspecies Performative Tool Making for Embodied Science | Andrew Quitmeyer | 1.Encounter Phenomenon  2.Experiential Assay  3.Experimentation  4.Analysis  5.Review  6.Data Distribution | <https://www.ubicomp.org/ubicomp2013/adjunct/adjunct/p325.pdf> | |
| 2**.** | Learning Schooling Behaviour from Observation | Brian Hrolenok and Tucker Balch | 1.Learning fish schooling  2.Fish sensor features  3.Fish actuators  4.Learning  5.Simulations of learned behaviour | <https://direct.mit.edu/isal/proceedings-pdf/ecal2013/25/686/1901629/978-0-262-31709-2-ch098.pdf> | |
| 3**.** | From Digital Nature Hybrids to Digital Naturalists: Reviving Nature Connections Through Arts, Technology and Outdoor Activities | L.Ewards, A.Darby,and C.Dean | 1.Introduction  2.Background  3.Design Lens  4.Using the Critical Lens to Establish Design Guidelines  5.Artifacts  6.Reflections on the Digital Nature Hybrid Design  7.Digital Naturalist  8.Reflections on Digital Naturalist | <https://www.researchgate.net/publication/342374043_From_Digital_Nature_Hybrids_to_Digital_Naturalists_Reviving_Nature_Connections_Through_Arts_Technology_and_Outdoor_Activities> | |
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