

Conference Abstract

Improving Biological Collections Data through Human-AI Collaboration

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Received: 10 Sep 2023 | Published: 11 Sep 2023

Citation: Stenhouse A, Fisher N, Lepschi B, Schmidt-Lebuhn A, Rodriguez J, Turco F, Toms E, Reeson A, Paris C, Thrall P (2023) Improving Biological Collections Data through Human-AI Collaboration. Biodiversity Information Science and Standards 7: e112488. <https://doi.org/10.3897/biss.7.112488>

Abstract

Biological collections play a crucial role in our understanding of biodiversity and inform research in areas such as biosecurity, conservation, human health and climate change. In recent years, the digitisation of biological specimen collections has emerged as a vital mechanism for preserving and facilitating access to these invaluable scientific datasets. However, the growing volume of specimens and associated data presents significant challenges for curation and data management. By leveraging human-Artificial Intelligence (AI) collaborations, we aim to transform the way biological collections are curated and managed, unlocking their full potential in addressing global challenges.

We present our initial contribution to this field through the development of a software prototype to improve metadata extraction from digital specimen images in biological collections. The prototype provides an easy-to-use platform for collaborating with web-based AI services, such as [Google Vision](#) and [OpenAI](#) Generative Pre-trained Transformer (GPT) Large Language Models (LLM). We demonstrate its effectiveness when applied to herbarium and insect specimen images. Machine-human collaboration may occur at various points within the workflows and can significantly affect outcomes. Initial trials suggest that the visual display of AI model uncertainty could be useful during expert data

curation. While much work remains to be done, our results indicate that collaboration between humans and AI models can significantly improve the digitisation rate of biological specimens and thereby enable faster global access to this vital data.

Finally, we introduce our broader vision for improving biological collection curation and management using human-AI collaborative methods. We explore the rationale behind this approach and the potential benefits of adding AI-based assistants to collection teams. We also examine future possibilities and the concept of creating 'digital colleagues' for seamless collaboration between human and digital curators. This 'collaborative intelligence' will enable us to make better use of both human and machine capabilities to achieve the goal of unlocking and improving our use of these vital biodiversity data to tackle real-world problems.

Keywords

curation, digital curator, named entity recognition, OCR

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Presented at

TDWG 2023

Conflicts of interest

The authors have declared that no competing interests exist.