# AutoDeck-AI at EcoHack-2025: 🌿 Eco-Centric Slide Generator

## Problem statement

Creating targeted scientific presentations in the field of ecology research is inefficient and labor-intensive. To address research to a diverse audience, including researchers, practitioners, and funding bodies, several fundamental changes are needed. Ecologists face the following challenges when preparing presentations:

- Time constraints: Developing presentations from raw data, abstracts, and other materials take up valuable time that could be spent on basic research or decision-making.
- Inadequate audience adaptation: Current tools do not adapt the material to many audiences, including researchers who need comprehensive techniques and practitioners who seek practical knowledge.
- Lack of domain-specific tools: There is no slide generator tailored for ecology research that could extract figures and tables from scientific PDF files and integrate them into corresponding PowerPoint sections.
- Presentation from abstract & supplementary material: The existing tools don't have the ability to generate presentations based on abstracts and supplementary material.

## Motivation

Ecological research is essential to address environmental issues such as climate change, species extinction, and conservation efforts. However, competent communication of results to collaborators is essential to:

- Establish interdisciplinary cooperation.
- Obtain financial support for important research projects.
- Transform research findings into actionable strategies for policy makers and practitioners.

## Solution

AutoDeck-AI is an innovative solution designed to address these challenges by integrating advanced AI capabilities. It offers:

- Create presentations for ecological research, adapted to different audiences: researchers, practitioners, or funding organizations.
- Extract photos, charts, and tables from the manuscript, automatically generate captions and assign them to the appropriate slide sections - a feature missing from existing tools.
- Work efficiently with incomplete drafts, or abstracts along side supplementary materials, making it uniquely adaptable for preliminary research presentations.

## Non-technical Description

AutoDeckAI provides a streamlined, easy-to-use process for creating high-quality presentations:

- Submission option: Upload PDF manuscript or abstract and supplementary materials.
- Target audience selection: Researchers, Practitioners, or Funding bodies.
- Slide structure: Select the number of slides and it automatically generates and organizes content into a consistent order using embedded headings, bullet points, figures, and tables.
- Create a downloadable PowerPoint presentation with well-formatted slides and subtitles.

## Technical Description

The tool uses PyPDF2 and PyMuPDF to extract text, figures, and tables from PDF/abstract and supplementary materials, using heuristics to detect visual components and GPT-4o to create synthetic labels, content generation based on prompts and content structuring. Content is designed for academics, practitioners, and funding organizations, and uses customizable themes to increase engagement.

Text is divided into coherent sections and slides are created with integrated images and subtitles. FAISS embeddings facilitate rapid information retrieval, while python-pptx ensures consistent, high-quality presentations. Effective error handling ensures results despite processing complications and facilitates the development of professional, audience-focused slideshows.

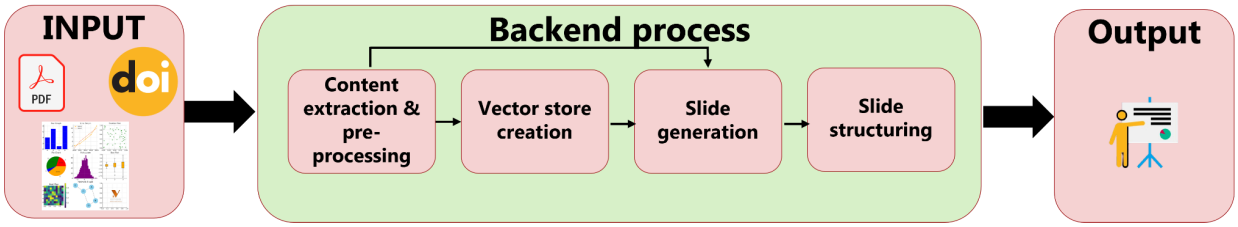


Fig 1: Workflow of AutoDeck-AI: Eco-centric slides generator

## Future Recommendations

- Create class-specific presentations from multiple papers, tailored like a class session.
- Design one or two customizable decks instead of an entire presentation for flexibility.
- Enable chatbot-assisted refinement and reconfiguration before finalizing.
- Offer an option for image-rich slides to emphasize visuals over text.

## Code Link:

https://github.com/javadr/AutoDeckAI/

## Demo Video Link:

(2-3 min, upload to YouTube or Loom)

https://www.loom.com/share/2f045c457fd747179d36d298480cf1e8

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