(Un)Natural Language

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1 Introduction

What narratives lie buried beneath the gridlines of urban development, within the margins of policy and loan documents, or in the silences surrounding ecological impact? What stories are concealed beneath the public language of government, in service of economic growth? *(Un)Natural Language* is an art software, further developed into an interactive online archive and installations, that examines and documents how words make worlds in government project documents. It is an experimental project exploring the intersection of computational technology, ecology and linguistics to create a new analytical lens for complex issues in urbanization related to water, rivers and oceans.

This work offers an alternative application of computing, creating new ecological discourses that critically reflect on water urbanization. The collected government documents form a sequence-based dataset, which is labelled with three specific categories—pro-growth, ecologically dominating and neutral. A language model is subsequently trained on this dataset to detect sentences that embody growth-oriented and extractive ideologies. In doing so, it reveals the hidden assumptions from the government texts, tracing the linguistic fingerprints of ecological narratives embedded in urban water governance, management and development.

As Donna Haraway writes, "it matters what stories we tell to tell other stories with; ... It matters what stories make worlds; what worlds make stories." Inspired by this, this project expands the possibilities for public engagement with language as an active ecological force, illustrating how words can shape, distort, and potentially heal our relationship with the environment [Haraway 2016]. This article presents a working ecological natural language processing (NLP) system that operates both as a critical research tool and as an artistic presentation for gallery audiences, contributing to ecology environmental activism, net art, and alternative NLP. By lifting the veil of bureaucratic language, it empowers viewers and users to recognize, question, and reimagine the hidden ideological structures shaping ecological discourse.

2 Project Description

Project Archive Link: `https://driftinglab.github.io/unnatural-language/`

2.1 Concept

(Un)Natural Language carries a dual meaning: it critiques the ideological constructions hidden within so-called "natural language," while simultaneously referencing NLP technology. This project collects program appraisal documents from the World Bank, which include program descriptions, implementation plans, frameworks, and assessments—particularly for hydrology-related projects

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39th Conference on Neural Information Processing Systems (NeurIPS 2025) Creative AI Track.

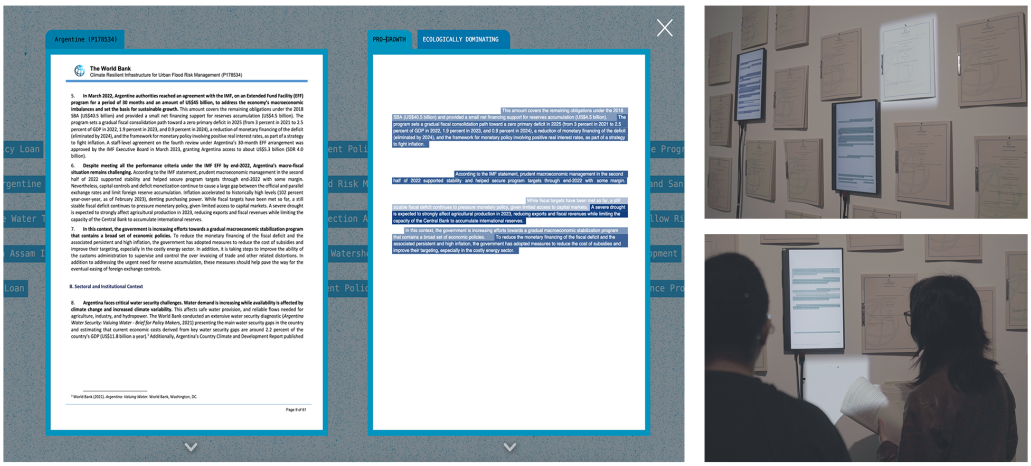

Figure 1: Online archive analysis page and the installation developed from the art software (©Peijing Mou.)

such as water security and water management. A close reading of these documents reveals that the language employed is far from neutral; rather, it carries implicit ideological assumptions often overlooked in bureaucratic discourse. Specifically, it reflects a capitalist mindset that privileges economic expansion over relational forms of development or alternative ways of living. To excavate these hidden narratives, this project systematically labels each sentence into three categories: pro-growth, ecologically dominating, and neutral.

Growth, as Hickel (2020) observes, is the ideological core of capitalism, driven by accumulation, commodification, and colonization. Growth hegemony refers to the cultural dominance of this ideology, often concealed within narratives of sustainability and technological progress. Pro-growth language demands increasing material and energy input, promotes economic expansion as inevitable, and frames technological innovation as the primary solution to ecological crises. Beyond surface promises, the construction of language reflects deeper anthropocentric and capitalist logics, subtly shaping public perception. Thus, critically identifying the ideological assumptions in public project documents is essential to resist the silent reproduction of growth-driven worldviews.

Ecological domination, on the other hand, reflects a worldview in which ecosystems, species, and landscapes are framed as passive, quantifiable resources to be managed, optimized, or extracted for human benefit (Plumwood, 2002). Rooted in critical theory, this concept traces how Enlightenment rationality and capitalist development paradigms extend anthropocentric control into the ecological sphere. In contemporary discourse, ecologically dominating language often hides beneath narratives of development, management, and even conservation, framing human intervention as necessary and beneficial while perpetuating power over nonhuman life. Identifying ecological domination within language is crucial for unveiling how even well-intentioned environmental projects can replicate dominative attitudes toward nature, silencing its agency and complexity.

While pro-growth discourse emphasizes economic development, ecologically dominating language centers on extractivist logics. Though often intertwined, these two ideologies are distinct—some texts reflect both, while others reveal only one. Building on the critical definitions of pro-growth and ecologically dominating, this project repurposes an experimental computational model for ecological analysis. What (Un)Natural Language seeks to build a relational and ecological ML — powered by minimal, local energy, built on a system that supports a more-than-human world. It reconfigures algorithms to trace hidden ecological narratives embedded within urban development discourse.

2.2 Technical Description

API: `https://huggingface.co/spaces/Melodyu/unnatural-language`

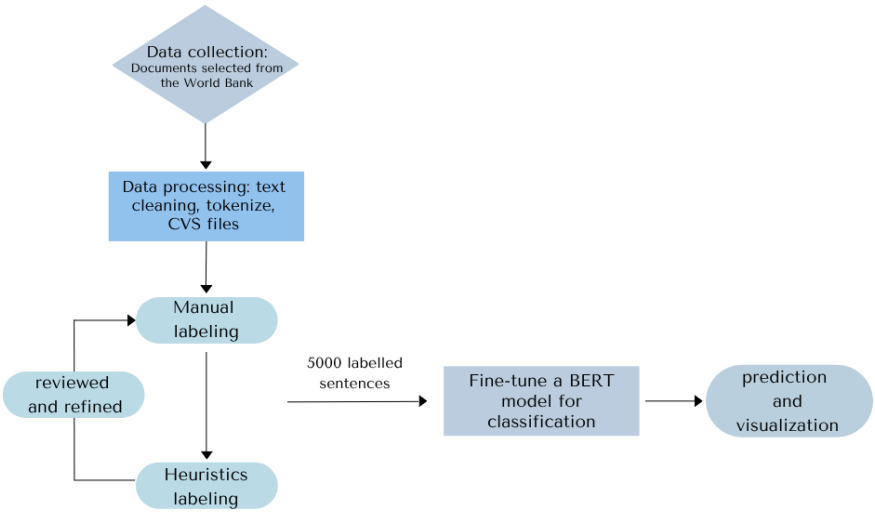

Figure 2: System workflow (©Peijing Mou.)

Model: `https://huggingface.co/Melodyu/unnatural-language`

Dataset: `https://huggingface.co/datasets/Melodyu/unnatural_language`

This system is built on a pretrained BERT (Bidirectional encoder representations from transformers) model, fine-tuned specifically for a multi-label classification task on a custom-labeled dataset. It classifies sentences such as pro-growth, ecologically dominating and neutral. The model focuses on identifying ecology-, management-, economics-related etc. phrases and hidden ideologies based on actions (e.g., development, extraction, expansion), perspectives (e.g., capitalism, domination, greenwash), and priorities (e.g., economic growth). The system includes four primary phases: data collection and processing, labeling, training and interpretive output generation.

Public documents from the World Bank were collected, cleaned, and segmented into sentences using the NLTK tokenizer in Python. Labeling was conducted on the Refinery platform using a hybrid, iterative human–machine workflow. Approximately 50% of the dataset was manually labelled to establish consistent criteria grounded in degrowth values. Sentences were marked as:

- `Pro-growth`: language that reflects a growth-oriented mindset, prioritizes economic expansion, or treats ecological and social limits as solvable via technological or market-based interventions.
- `Ecologically dominating`: language that frames nature through anthropocentric or managerial logics—treating ecosystems as resources to be controlled, extracted, or optimized.

These annotations informed rule-based heuristics that assisted in labeling the remaining data. The process was recursive: machine-generated labels were reviewed, refined, and selectively overwritten. In total, approximately 5000 sentences were labeled. The artist re-entered the loop multiple times to incorporate edge cases and update definitions—treating labeling as a critical intervention, not a neutral task.

The labeled dataset was then exported to fine-tune a customized BERT model, modified with additional dropout and dense layers for multi-label text classification implemented in PyTorch. Once trained over 300 epochs, the model assigns category labels to new input sentences and returns a score

Figure 3: New generated document overview. (©Peijing Mou.)

for each labeled sentence based on its computed latent embeddings, indicating the degree to which the sentence aligns with the assigned category.

The visualization system turns the scores returned from the model into new generated documents. It gives the audience clear highlights to read and reflect the language used in these sentences, with different color shades indicating different levels of visibility and severity of growth or ecological domination. Figure 3. displays what the entire language pattern looks like in one government project document.

3 Contributions

(Un)Natural Language offers a new contribution at the intersection of climate activism, net art and alternative AI research. Within climate activism and public discourse, this project directly addresses the materiality of language—how words shape worlds. While conventional critical discourse analysis is often confined to academic contexts, this system not only increases the capacity for close and distinct reading without sacrificing critical sensitivity, but also significantly accelerates the process, making large-scale analysis feasible for broader publics.

Rather than pursuing model optimization or predictive accuracy under the prevailing logic of ML, this system redefines effectiveness within a critical-ecological frame: it treats returned values as a structural condition of ideological language rather than classification prediction. The labeling process is inherently subjective—an intervention guided by the artist's commitment to degrowth. Situated within net art, the model embraces the productive ambiguities of machine interpretation, rejecting the pursuit of technical perfection in favor of deeper political resonance.

In the field of NLP, this project exemplifies an alternative use of AI: not to accelerate growth, optimize extraction, control or commodify attention, but to assist in building critical, slower, and more ecologically attuned reading practices. Technology is never neutral. Who designs it, for what purpose, and within which ideological framework determines whether it enables emancipation or domination. In this process, AI becomes more than a tool: it introduces the perspective of another intelligence, another way of being. By engaging with this non-human interpretive presence, the work prompts us to reconsider human identity, roles, responsibilities, and value systems in a world where we coexist not only with technology but also with waters and other planetary agencies. This re-framing opens the question of how humanity can live in greater reciprocity with the more-than-human world.

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Short biography

Melody Mou Peijing(she/her) is a media artist whose work explores ecology and experimental narrative through computational technologies. Her research addresses threatened ecologies in the context of social conflicts, indigenous knowledges, and the ways language reproduces ideological assumptions. Her current art practice investigates alternative uses of technology, especially machine learning and electronics, for ecological purposes.

Her working process often involves writing, field research, and data or information collection to create poetic narratives. How can we extend empathy to nature? What roles can art and technology play in addressing ecological crises? Her goals revolve around developing innovative applications of technology and demonstrating how digital media can nurture our coexistence with non-human agencies. She researches how culture and technology (e.g., indigenous knowledge, language, and AI) construct our relationship with nature. Her recent work include *Wiikwegamaa*, a sound installation on local water ecosystems and indigenous epistemology (Media Arts Award, FutureTense 2022); *Latent Words*, which investigates interpretable AI and language model imaginaries; and *Rhuthmus*, a research project led by Dr. Hector Rodriguez, exploring the unique possibilities of machine learning to reconfigure moving images, presented at CVPR AI Art Gallery 2024.

Her artwork has been shown in a variety of contexts, including FILE Festival, The New River, VIDEOFORMES, New Media Writing Prize, and FutureTense Awards. Melody worked as a researcher and a creative technologist for ACIM SCM Lab and Hong Kong Arts Development Council. Currently, she is an MFA student at the UCLA Design | Media Arts.

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