SEM25. Language, ecology, and artificial intelligence: A critical eco-linguistic perspective

11 September h. 16:00-18:30, PN 9

Convenors
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Abstract
As artificial intelligence (AI) reshapes our world (Brown et al., 2020, Bender & Koller, 2020, Bowman & Dahl, 2021), its role in framing and influencing environmental perceptions demands exploration. This seminar examines the intersection of Ecolinguistics and AI, emphasizing how AI discourse shapes ecological understanding. As language influences attitudes toward environmental crises, Ecolinguistics (Stibbe, 2021) provides tools to assess how AI narratives reinforce or challenge ecological values (Vallego, 2023). Research may examine how AI reproduces or contests dominant discourses, promotes sustainability or unsustainability, and the ethical implications of AI-generated 'natural' experiences.

A central premise is that language does not merely reflect reality but constructs it. Halliday observed how Western languages, particularly English, encode an anthropocentric worldview, positioning nature as passive rather than autonomous. Grammar limits nature's agency yet frames destruction actively, as in "the earthquake destroyed the city" (Halliday, 1992: 85). If AI is trained on data reflecting these patterns, it risks reinforcing an instrumentalist view of nature, perpetuating its subordination to human interests. Lexical choices in AI-generated texts shape public perception, either reinforcing or mitigating environmental urgency.

This seminar explores AI's potential to disseminate environmental awareness, reduce ecological footprints via virtual simulations, and enhance digital communication. Conversely, AI could enable greenwashing, subtly manipulating consumers who equate technology with environmental salvation. It may also present simulations as substitutes for direct contact with nature. As ecolinguists, we must ask whether AI can advance the ecological agenda by fostering ethical discourse. Could it amplify voices advocating sustainability or deepen nature's commodification? We invite contributions addressing these questions and further establishing Ecolinguistics as central to environmental and linguistic studies. We welcome contributions on:
- Virtual vs. real nature experiences
- AI and ecological imaginaries
- AI in environmental politics
- AI and environmental justice
- AI and greenwashing
- AI and sustainability discourse
- Ecological representations in digital media
- AI and green identities
- AI in environmental risk prevention
- AI and biodiversity
- AI for ecological advocacy
- AI and ecological narratives
- AI in human–more-than-human relations

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SEM25. Papers

11 September h. 16:00-18:30, PN 9
- *The role of AI discourse in ecolinguistics and the language of coffee in Italian heritage* (Daniela Giordano, Università degli Studi di Napoli Parthenope)
- *Greening AI? Discourse, framing, and narrative analysis of environment-related AI-generated texts* (Paola Brusasco, Università degli Studi "G. d'Annunzio" Chieti-Pescara)
- *AI and the green narrative: A comparative ecolinguistic analysis* (Vivian M. De La Cruz, Università degli Studi di Enna "Kore")
- *Framing the climate with algorithms: Political discourse and the risks of AI amplification* (Anna Raimo, Alma Mater Studiorum Università di Bologna / Caterina Giachino, Università di Napoli Federico II)
- *The H4rmony project: Ecosophy-guided AI for an ecologically just AI future* (Martina Russo, Alma Mater Studiorum Università di Bologna / Jorge Vallego, Independent researcher at The h4rmonyproject)

SEM25. Abstracts

Greening AI? Discourse, framing, and narrative analysis of environment-related AI-generated texts

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Artificial intelligence (AI) and related technologies are discussed in ways that span from enthusiastically envisioning life-enhancing solutions to scary warnings about a looming Singularity, a superintelligence which will hugely exceed the human brain and possibly endanger human life on the planet. Similarly, with regard to the environment, AI is saluted as a tool that has "the ability to revolutionise how we approach these problems by presenting fresh ideas and data-driven understandings" to combat climate change, reduce energy consumption and improve agriculture (Satpathy et al., 2025: 2), but it is also acknowledged as a generator of texts or visuals that can be used, among others, by corporations, public bodies and cultural institutions to influence consumers' behaviours and the public's perception of their actions, resulting at times in greenwashing (Vallego, 2023; Miller, 2018). Concern is also expressed about AI's sustainability in terms of emissions, energy consumption, and e-waste, as well as the need to ensure that technologies do not worsen the predicaments of already marginalized groups (Dua & Patel, 2024). Vallego (2023) advocated for the incorporation of ecolinguistics principles in the training of Large Language Models like ChatGPT, with an emphasis on the role of human supervision and reinforcement feedback. Building on that study, the paper is based on interactions with ChatGPT, Cohere, and Claude Sonnet ranging from supposedly innocent word-association requests to questions about humans and the planet, from AI's energy policies to inputs meant to elicit self-reflective answers and ascertain if and to what extent environmental awareness has been added to the training data. The outputs suggest that it has, especially in the case of Claude, whose cutoff date was November 2024. They also show GPT's tendency to anticipate – and even create – users' needs by offering to further elaborate on the output or give it a different format, a feature which in certain contexts might be seen as a distractor and surely as a byproduct of the consumeristic paradigm of "more", as well as a preference, shared with Cohere, for concrete terms, practical solutions and bullet-point answers; Claude, instead, produces articulate answers that highlight the importance of weaving ethics within knowledge and acknowledge cultural diversity and the ensuing different relations to nature. The paper compares the texts generated by the three AIs using discourse, framing and narrative analysis (Van Hulst et al., 2024) in an eco-linguistic perspective in order to assess their potential impact.

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AI and the green narrative: A comparative ecolinguistic analysis
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As large language models (LLMs) such as ChatGPT become widely used in everyday writing, education and communication, they are progressively shaping the narrative landscape. This also includes how people conceptualize nature, climate change, and human-environment relationships, with anthropocentric biases being implicitly communicated and reinforced (Grasso et al., 2025). As Vallego (2023) argues, these systems may very well become the central reservoirs for the stories through which societies interpret the world. This presents both risks and opportunities: while ecologically destructive ideologies may be replicated and scaled, these technologies may also hold the potential for advancing discourse that supports environmental awareness and justice.

Building on Vallego's ecolinguistic analysis of ChatGPT, this paper compares the affective environmental discourse produced by two large language models: the widely used general purpose ChatGPT, and Theophrastus, an experimental AI powered chat assistant developed within the H4rmony project, in collaboration with the University of Gloucestershire, to embody ecolinguistic principles in its conversational outputs. (hWps://theh4rmonyproject.org/about-us/).

The comparison applies Arran Stibbe's (2021) framework of nine cognitive story types: ideology, framing, metaphor, evaluation, identity, conviction, erasure, salience and narrative, to analyze how each system frames ecological meaning, constructs environmental identities, and expresses (or omits) relational values.

Using matched prompts across all nine story types, the study investigates how each model engages with ecological themes, including the simulation of empathy in relation to the more- than-human world. The analysis builds on Vallego's methodological foundation while raising awareness of Theophrastus as a proof of concept, a model designed to implement ecological ethics in AI.

This contribution integrates ecolinguistic theory and critical AI discourse analysis, and invites

reflection on how environmental narratives are shaped, and potentially reshaped, by the language technologies we increasingly rely on.

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The H4rmony Project. https://theh4rmonyproject.org/

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The role of AI discourse in ecolinguistics and the language of coffee in Italian heritage
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In an era marked by environmental urgency and digital transformation, the intersections between ecolinguistics, artificial intelligence (AI), and semiotics are of growing academic significance (Vallego, 2023). Language models, as a key development in AI, can offer benefits to society by enhancing a range of communicative and technical tasks. However, they may also generate harmful linguistic practices, thus facilitating the spread of misinformation (Brown et al., 2020, pp. 34-35). This is an issue of particular concern within ecolinguistics that, as Stibbe (2015, p. 2) noted, critically examines (multimodal) texts in order to uncover and evaluate dominant cultural narratives from an ecological standpoint.

This paper explores the influence of both human and AI-generated discourse on ecological awareness, with a focus on the semiotic-linguistic function of coffee in expressing and transmitting Italian heritage. To this end, authentic texts will be examined and compared with AI-generated counterparts produced by ChatGPT, with the aim of identifying how discursive strategies vary across sources and modalities. Discourse Analysis of mainstream multimodal texts may reveal

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how linguistic constructs may both convey and obscure sociocultural meanings and ecological values and can shape national identities to varying extents (Abbamonte & Cavaliere, 2022).

Drawing on ecolinguistic theories, in particular the dynamic interplay between linguistic practices, ecological systems, and environmental contexts (Fill & Mühlhäusler, 2001), the "stories-we-live-by" framework (Stibbe, 2015), and Goatly's (1996) concept of "green grammar", alongside Jewitt's multimodal framework (Jewitt et al., 2016) as an additional resource, this paper investigates how both AI discourses and culturally embedded linguistic practices, such as those of Italian coffee culture, function as discursive technologies that shape ideologies, perceptions, and ecological values. Manning noted that the overall behaviour of artificial intelligence systems "emerges via learning from data or experience" (2020: 1), signalling a significant shift in system design, whereby behaviour is no longer solely determined by explicit programming but largely shaped through data-driven learning and experiential adaptation. Furthermore, AI is increasingly tasked with shaping food systems (communication) and ecological data flows. Yet, this process demands ethical accountability, and should be examined against the criteria of transparency, traceability and responsibility (Manning et al. 2022: 33-34). Accordingly, ethical implications of mediated environmental and cultural narratives will be discussed, offering some recommendations for responsible AI design and linguistic preservation.

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Framing the climate with algorithms: Political discourse and the risks of AI amplification
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This study explores the linguistic construction of environmental discourse in Italian political communication at the Conferences of the Parties (COP) from 2010 to 2024, adopting a combined ecolinguistic and digital methodological lens. Grounded in the theoretical framework of ecolinguistics (Stibbe, 2021), it employs a mixed-methods approach integrating computational techniques with *Critical Discourse Analysis* (CDA) (Fairclough, 2013; Van Dijk, 2015) and *Frame Analysis* (Goffman, 1974; Hulme, 2009).

To mitigate interpretative subjectivity, automated topic modelling (*Latent Dirichlet Allocation*) was initially conducted using Python's NLP libraries (nltk, gensim, pyLDAvis) (Jelodar et al., 2018; Xue et al., 2020), enabling the extraction of latent semantic patterns across corpora comprising political texts, institutional speeches, and media discourse. These data-driven results were then interpreted through CDA and Frame Analysis, which respectively illuminate how discourse sustains power structures and how narrative scaffolding shapes public imaginaries of the climate crisis. The analysis identifies two dominant frames – *Sustainability and Climate Policies* and *Economic and Financial Strategies* – each associated with contrasting value systems: intrinsic (e.g. cooperation, justice) and extrinsic (e.g. profit, technological advancement) (Stibbe, 2021).

Finally, in view of the growing use of AI to generate or summarise political and environmental content, the study reflects critically on the risk that such technologies may perpetuate rhetoric detached from ecological data. If language models are trained on corpora imbued with ideologically distorted narratives, they may reproduce misleading

representations of the climate crisis. As Vallego (2023) suggests, ecolinguistics provides essential tools for assessing whether AI-generated narratives reinforce or challenge ecological values, offering a robust framework for the ethical design of environmentally responsible language technologies.

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The H4rmony project: Ecosophy-guided AI for an ecologically just AI future

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As artificial intelligence increasingly generates language that shapes public perception and cultural narratives, the ecological values embedded within these outputs are crucial. The present paper introduces the H4rmony project as an interdisciplinary initiative to guide the development of AI systems, specifically Large Language Models (LLMs), to make the outputs of AI systems more ecologically responsible. Drawing on these principles, H4rmony proposes its own ecosophy, centred on shared values such as care, interdependence, and deep adaptation, that informs all stages of AI model creation, from dataset construction to specialist applications.

H4rmony's ecosophy is not only a theoretical framework but also a guiding architecture for developing four interrelated AI artefacts:

(1) Ecolinguistically-aligned datasets, designed through a specific narrative/counter-narrative structure to (re)align the internal model context through AI techniques such as Supervised Fine Tuning and Reinforcement Learning.

(2) Fine-tuned LLMs, when trained on H4rmony's datasets, enriched with ecologically conscious linguistic patterns, and guided by its own ecosophy, demonstrate a noticeable shift away from anthropocentric ideologies. Instead, they increasingly align with ecocentric narratives that promote sustainability, interspecies justice, and reverence for the ecological systems upon which all life depends.

(3) Evaluation models that assess the outputs of language models through an ecolinguistic lens. These models integrate cognitive structures, drawing upon ecological domains of awareness. They critically examine rhetorical strategies, and operate across a multilingual spectrum, ensuring that ecological values are preserved and articulated across diverse linguistic and cultural contexts.

(4) Specialist models, developed under the supervision of ecolinguists, are trained to assist the analysts in their eco-critical discourse analysis. These specialist models aim at generating discursive insights by identifying, interpreting, and evaluating linguistic patterns that shape perceptions about the natural world.

Our project highlights the linguistic features of the outputs before and after H4rmony's intervention, revealing how ecological narratives are embedded or erased through AI training. We argue that ecolinguistics, with its critical framework and vision for new-stories-to-live-by, offers a valuable structure for analysing and helping in the creation of language models that support sustainability values and environmental justice. In doing so, we position H4rmony as a methodological bridge between AI ethics and ecological discourse, and call for a broader adoption of ecosophy-guided AI design.

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