

# Neurodivergent Cognition and Biocentric Empathy in Humans:

For Alignment and Emergent Abilities in Advanced AI Development

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## **Suggested Application Framework**

This theory is intended to inform the design space of impact-oriented AI licensing. Specifically, it proposes alignment goals that should be enforced through the adoption of new standardized clause families, such as the following **Commons Logics**:

- **Transparency Commons:** To mandate the contribution of standardized evaluations and documentation reflecting neurodivergent cognitive responses to the AI system.

- **Reciprocity Commons:** To encode patterns for recognizing and routing value back to diverse contributors, including those providing neurodivergent expertise, biocentric data, or environmental knowledge.
  - **Governance Commons:** To create multi-stakeholder oversight bodies that include representatives of neurodivergent groups and environmental/ecological experts.
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The concepts of neurodivergent cognition and biocentric empathy introduce fascinating and complex considerations for fine-tuning AI, pushing towards more inclusive, ethical, and potentially robust AI systems. While direct research explicitly linking all three concepts ("neurodivergent cognition," "biocentric empathy," and "AI fine-tuning") is still emerging, we can explore how each element, and their intersection, could influence the process.

Here are some papers that provide insights into the underlying themes:

## Neurodivergent Cognition and AI Fine-tuning:

\* The paper "Deep Neural Networks and Brain Alignment: Brain Encoding and Decoding (Survey)" by Oota et al. (a year ago) and "Naturalistic Computational Cognitive Science: Towards generalizable models and theories that capture the full range of natural behavior" by Carvalho and Lampinen (9 months ago) explores the relationship between AI models and human brain functions. Understanding neurodivergent cognitive styles, which involve diverse ways of processing information, perceiving the world, and interacting socially, could lead to AI fine-tuning strategies that enhance inclusivity and adaptability. For instance, AI models fine-tuned with data reflecting neurodivergent perspectives might develop more flexible reasoning patterns or be less prone to biases inherent in neurotypical-centric datasets. This could involve specialized datasets, novel reward functions in reinforcement learning, or architectural modifications that encourage diverse problem-solving approaches. The paper "Large Language Models and Cognitive Science: A Comprehensive Review of Similarities, Differences, and Challenges" by Niu et al. (a year ago) also delves into the intersection of LLMs and cognitive science, which could inform how different cognitive processes, including neurodivergent ones, might be modeled or accommodated in AI.

## Rethinking IDE Customization for Enhanced HAX:

A Hyperdimensional Perspective" by Koohestani and Izadi (a year ago) discusses the need for customization in AI-integrated development environments to align with diverse user preferences. This principle could extend to fine-tuning AI to better suit neurodivergent users or to incorporate neurodivergent ways of thinking in its internal processes.

## **Biocentric Empathy and AI Fine-tuning:**

\* Biocentric empathy, which extends ethical considerations to all living beings, could profoundly influence AI fine-tuning by reshaping its objectives and evaluation metrics. The paper "Chain of Empathy: Enhancing Empathetic Response of Large Language Models Based on Psychotherapy Models" by Lee et al. (a year ago) directly addresses enhancing empathetic responses in LLMs. While focused on human empathy, the methods could be adapted to consider a broader biocentric perspective.

## **AI Ethics by Design:**

Implementing Customizable Guardrails for Responsible AI Development" by Šekrst et al. (a year ago) discusses ethical guardrails for AI systems that align with diverse user values. A biocentric empathetic framework would necessitate guardrails that prevent harm to natural ecosystems and non-human life, influencing how AI systems interact with the environment, resource consumption, and decision-making in ecological contexts

## **Modeling Emotions and Ethics with Large Language Models**

by Chang (2 years ago) also explores integrating ethical considerations into LLMs, which could be extended to encompass biocentric principles during fine-tuning.

## **Feeling Machines:**

Ethics, Culture, and the Rise of Emotional AI" by Chavan et al. (6 months ago) delves into emotionally responsive AI, and while it focuses on human emotions, it opens the door for considering how AI could be designed to understand and respond to the "well-being" of non-human entities from a biocentric standpoint.

## **Intersection of Neurodivergent Cognition and Biocentric Empathy in AI Fine-tuning**

The intersection of these two concepts could lead to AI systems that are not only more inclusive of diverse human cognitive styles but also deeply integrated with an ethical framework that values all life. This might involve fine-tuning AI with datasets that highlight ecological interdependencies and the impact of actions on various life forms.

# **A Roadmap to Pluralistic Alignment**

by Sorensen et al. (a year ago) emphasizes the importance of aligning AI systems with diverse values and perspectives. This pluralistic approach naturally accommodates both neurodivergent perspectives and biocentric ethical considerations, suggesting that fine-tuning should move beyond a singular "human-centric" view.

## **Contemplative Artificial Intelligence:**

by Laukkonen et al. (7 months ago) discusses traditional alignment strategies and the complexities of intelligent systems, suggesting that new approaches are needed. Incorporating neurodivergent cognitive insights and biocentric empathy could be part of such novel alignment strategies, leading to AI that is more robust and less prone to unintended negative consequences on both human and natural systems.

## **The paper -Every 28 Days the AI Dreams of Soft Skin and Burning Stars:**

Scaffolding AI Agents with Hormones and Emotions" by Levinson and Agostino (4 months ago) explores biological inspiration for AI agents, which could be relevant to understanding how to integrate complex, ethically driven motivations like biocentric empathy into AI.

## **Summary:**

Fine-tuning AI with consideration for neurodivergent cognition could lead to more flexible, adaptive, and inclusive AI models that better understand and interact with a wider range of human experiences. Integrating biocentric empathy into fine-tuning could result in AI systems that prioritize the well-being of all living things, leading to more environmentally conscious and ethically aligned AI. The combination of these two perspectives has the potential to steer AI development towards a future where intelligence is not only advanced but also compassionate and universally beneficial.

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