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Open-ended Learning via Models of Human Notions of Interestingness (OMNI) [Zhang et al. 2024]



OMNI - Key Concepts [Zhang et al. 2024]

- **Unsupervised CL method**
- **Open-ended Algorithms:**
 - Aim to learn new, interesting behaviours indefinitely
 - Requires a vast environment search space
- **Challenges:**
 - Task Prioritization: Difficult to quantify & prioritize tasks that are learnable and interesting
- **Motivation:**
 - Create self-improving AI and AI-generation
 - Intelligent select new tasks that are learned
- **Approach:**
 - Utilize foundation models (ML-model trained on vast human-generated data = internet)
- **a**

OMNI - Methodology and Results

- OMNI - agent starts learning on appropriate level of tasks (pre-trained agent)
- Therefore tasks are sampled that show high learning progress
 - Success is evaluated periodically
- **Bidirectional Learning Progress:**
 - Tasks are weighted on recent improvement and degrading ability (forgetting)
- **Normalization and Sampling:**
 - Normalize Success rates
 - by comparison to random policy
- **Model of Interestingness:**
- Few-shot learning & Prompts of FMs
- **Novelty, Worthwhile, Learning progress**

