Prelims

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1 Abstract

[abstract itself]

[summary of intellecual merit, broader impacts?]

2 Introduction

2.1 Processing Ill-defined Phonetic Categories

- auditory processing as domain-general and domain-specific across multiple timescales [17]

2.2 paradoxes

levels of analysis:

phonetic perception has paradoxes at several levels of analysis that are not mutually discrete.

ontic/algorithmic: what *are* phonemes? are they positive descriptions of combinations of features, or negative descriptions of forbidden spectrotemporal state transitions?

implementation: to some degree the methodological and theoretical disagreements between the feature-detection and population-computation models of phonetic perception mirror the single-cell/multicellular computation dichotomy described in the introduction of [4].

- speed of processing vs. variability within category
- neurons that process auditory information at phonetic timescales are relatively insensitive to spectral quality [17]

2.3 ¡some of that neural theories of phonetic processing

- why are auditory neurons potentialyl sensitive to multiple stimulus features/how does that contribute to generalizable ill-defined catgories? [14]
- abrupt transitions, at least in neural data [5]
- other reward-learning regions like RSC [16]
- multimodal representations and preserved neural manifold dynamics across inference tasks in M1 [6]
- timescales of processing expand across auditory hierarchy (and more generally have different timescales of integration and lags) [17] and are lateralized [12]

2.4 scraps

- theoretical problems with simplified stimuli - low-dimensional and linearly-separable stimulus spaces are fundamentally different than the high complexity of naturalistic stimuli... for all we know the computations are just straight up not comparable! [22]

3 Methods

3.1 Scraps

- Segmenting strategies [1]
- Scrambled vs. unscrambled sounds? (cites 12, 18, and 25 in [17])
- inferring perception-action loops from data [20]
- complementary roles of cell types and manifold dynamics [4]

4 Specific Aims

5 Significance & Broader Impacts

6 meta

6.1 to-read

- revisit the tversky lit and check Danielle's cites for more
- the long-term imaging/ephys papes
- [14]
- [5]
- [19]
- [20]
- [21]
- [6]
- [15]
- [10]
- [3]
- [8]
- [18]
- [23]
- [13]
- [2]
- [9]
- [7] - methods
- [11] - methods
- [1] - methods

6.2 bookmarks

- [4] - p6

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