Intent Classification for Short User Queries

20191630 이진용

Project Overview & Motivation

Our Mission (2-Part)

1. Build GPT-2: Implement from scratch (CS224n Core)
2. Our Research: Use our GPT-2 for Short Query Intent Classification

Why Short Queries Matter?

- Users often use brief, concise inputs
- Short queries are ambiguous, hard for models
- **Goal: Test our GPT-2's ability to understand these short, tricky inputs**

Problem: The Challenge of Short User Queries

Intent Classification

Understanding user's goal from text

The Problem

Users type short, context-poor queries (ex. "Weather?", "Pizza nearby")

- This leads to ambiguity & misinterpretation by AI
- Results in poor user experience

Our Focus

Can our GPT-2 overcome this ambiguity in short queries?

Proposed Approach: Our GPT-2 for Short Queries

Core Idea

Fine-tune our self-built GPT-2 to robustly handle short queries

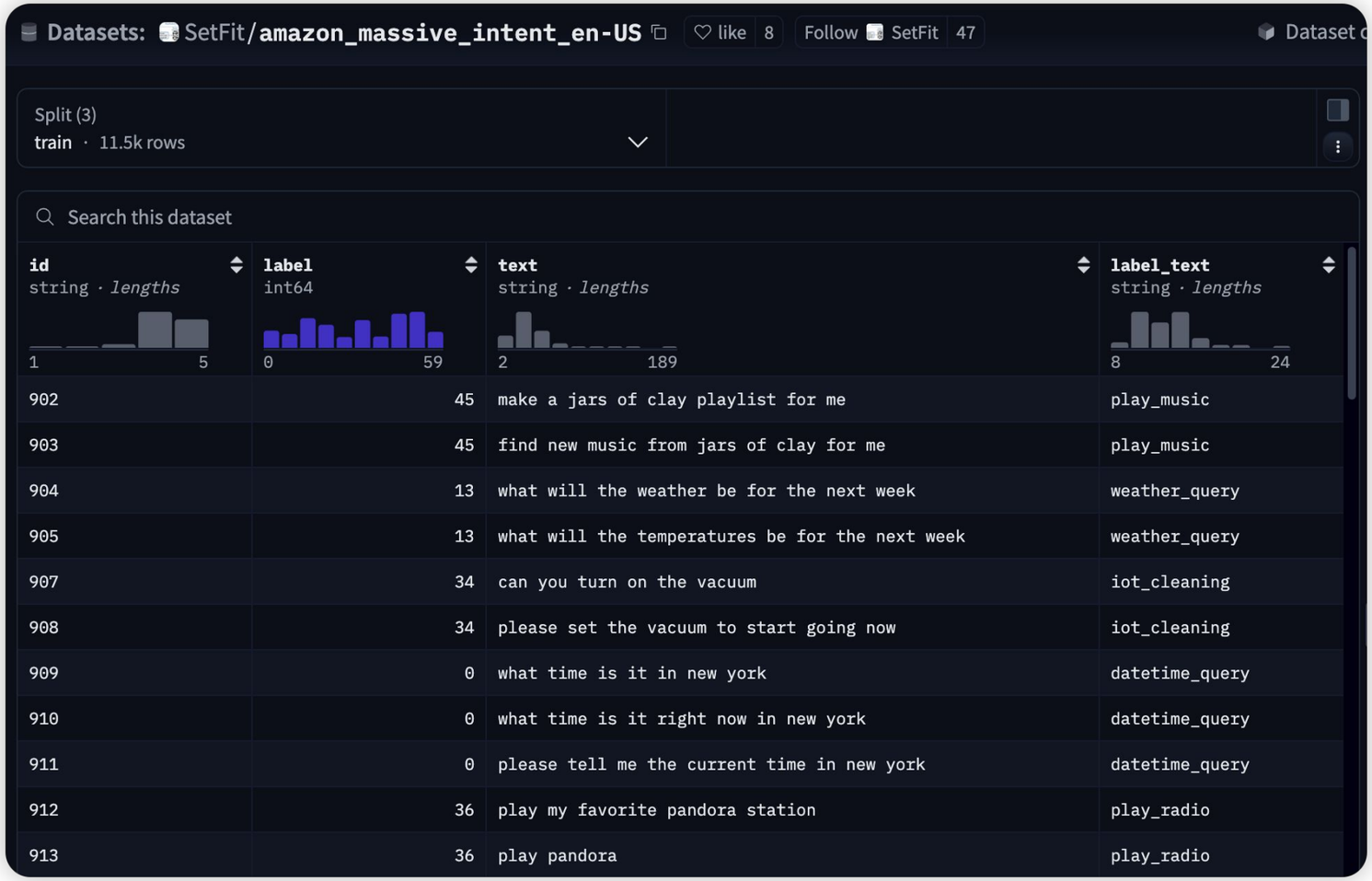
Research Question

How well does our GPT-2 classify intent for short queries vs. longer ones on the MASSIVE dataset?

Hypothesis

Our GPT-2's deep semantic understanding will enable strong performance on short, ambiguous queries.

Data & Resources



Dataset

SetFit/amazon_massive_intent_en-US

- User queries of varying lengths

Data Setup

- Standard tokenization
- Segment test data by query length (short vs. long)

Resources

- Our GPT-2 Codebase (CS224n skeleton)
- Hugging Face datasets library

Execution Plan & Expected Outcomes

1

Phase 1 (Weeks 1-2)

Implement GPT-2 & default tasks

2

Phase 2 (Weeks 3-4)

- MASSIVE data prep & short query segmentation
- Fine-tune & evaluate (full & segmented test sets)

3

Phase 3 (Weeks 5)

- Analyze short query performance, errors
- Report & presentation

Expected Outcomes

1. Working self-implemented GPT-2
2. Performance comparison: Short vs. long queries for our GPT-2
3. Insights: Where GPT-2 excels/struggles with short queries

Measuring Success

- Accuracy & F1-score on short vs. long query subsets
- Qualitative error analysis for short queries

QnA