

# Few-Shot Code Forensics: Detecting AI-Generated Code using UniXcoder Prototypical Networks

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# The Datasets

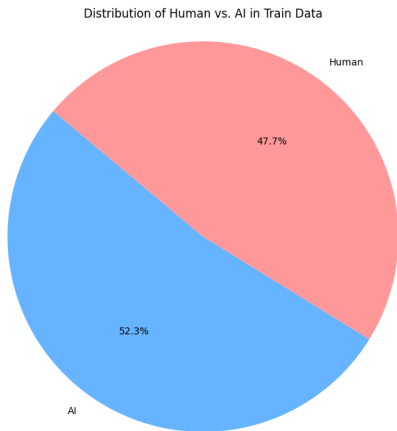


Figure: The distribution human vs ai accross training, validation, test

# The Datasets

Human-generated Code Snippet:

```
-----  
Language: C++  
Code:  
#define REP(i, n) for (LL i = 0; i < n; ++i)  
using LL = long long;  
class Solution {  
public:  
    int minNumberOfHours(int initialEnergy, int initialExperience, vector<int>& energy, vector<int>& experience) {  
        int n = energy.size(), res = 0;  
        REP(i, n) {  
            if (initialEnergy <= energy[i]) {  
                res += energy[i] - initialEnergy + 1;  
                initialEnergy = 1;  
            }  
            else {  
                initialEnergy -= energy[i];  
            }  
  
            if (initialExperience <= experience[i]) {  
                res += experience[i] - initialExperience + 1;  
                initialExperience = experience[i] * 2 + 1;  
            }  
            else {  
                initialExperience += experience[i];  
            }  
        }  
        return res;  
    }  
};
```

AI-generated Code Snippet:

```
-----  
Language: C++  
Generator: Qwen/Qwen2.5-Coder-7B  
Code:  
#define lower(X) transform(X.begin(), X.end(), X.begin(), ::tolower);  
#define upper(X) transform(X.begin(), X.end(), X.begin(), ::toupper);  
#define all(X) X.begin(), X.end()  
#define rall(X) X.rbegin(), X.rend()  
#define scan(data , total) for(int i = 0; i < total; i++) cin>>data[i]  
#define row(c,tot) int i = 0; while(i++ < tot) {data[i].clear(); cin>>data[i];}  
#define input(A,b) for(int D = 0; D < b; D
```

Figure: The example human vs ai generated code

# The Datasets

language	train_count	val_count	test_count
Python	457306.0	91461.0	303
C++	23392.0	4679.0	75
Java	19302.0	3860.0	256
C#	0.0	0.0	122
JavaScript	0.0	0.0	85
Go	0.0	0.0	60
C	0.0	0.0	51
PHP	0.0	0.0	48

Figure: The datasets summarize across training, validation, test

# ARCHITECTURE AND TRAINING STRATEGY

## Model Architecture

- microsoft/unixcoder-base, a pre-trained cross-lingual model suitable for code representation.
- Prototypical Network (Metric-based Meta-Learning).
- Projects code samples into a metric space and classifies them based on Euclidean distance to class prototypes (Human vs. AI)

# ARCHITECTURE AND TRAINING STRATEGY

## Training Strategy - Episodic Meta-Training

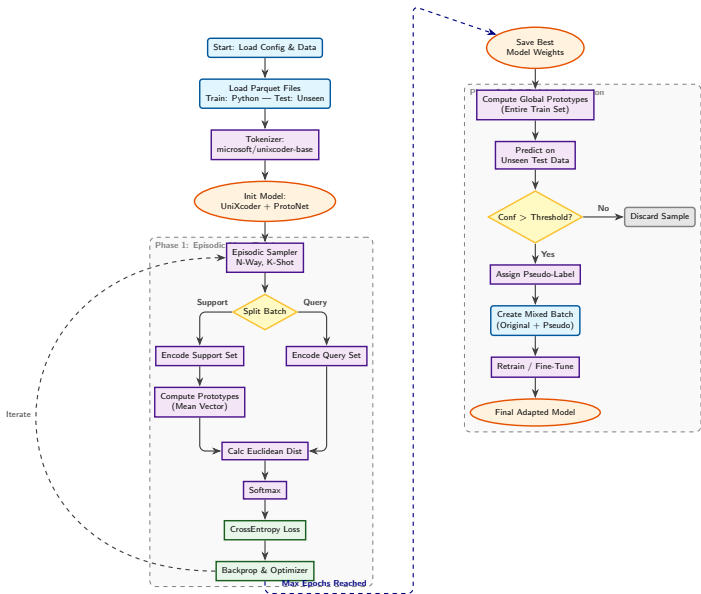
- Training simulates "N-Way, K-Shot" tasks ( $N=2$  classes,  $K=5$  support samples,  $Q=30$ )
- AdamW optimizer with learning rate decay
- $HIDDEN\ DIM = 768$  ,  $Q\ QUERY = 30$

# ARCHITECTURE AND TRAINING STRATEGY

## Training Strategy - Test Time Adaptation

- Pseudo-Labeling
- Transductive Fine-tuning

# ML Pipeline: Meta-Training & Adaptation





# Validation Report

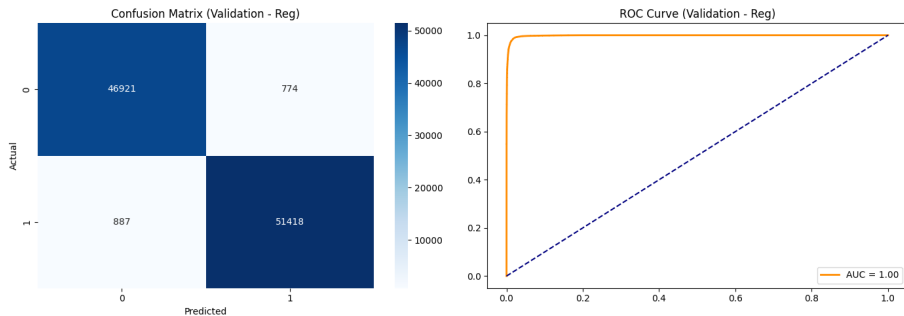


Figure: The metric on validation data

# Test Report

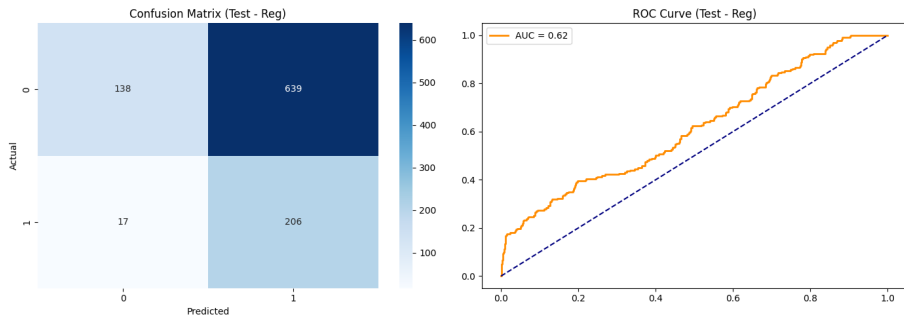


Figure: The metric on test data

# Test Report

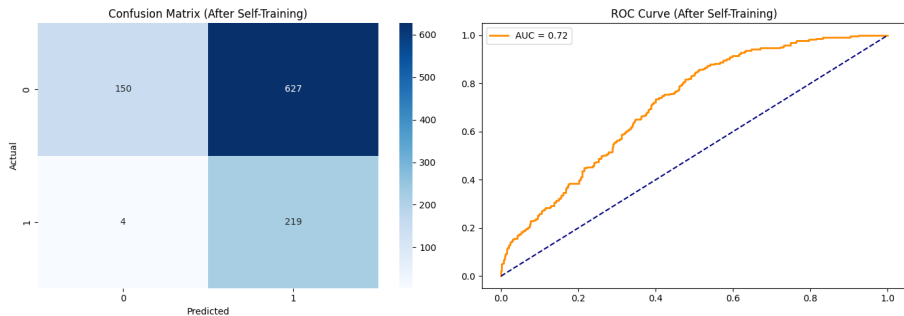


Figure: The metric on test data after self adaption

# Test Report

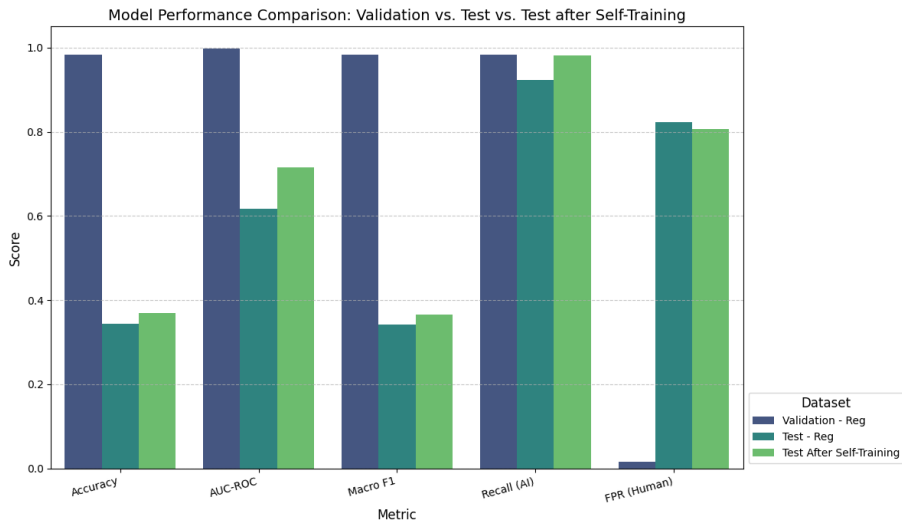


Figure: The model performance comparison

# Sem-eval 2026 Competition

Per 5 Dec 2025 - on going

- 218 Entrants
- 106 Participants
- 97 Teams
- 826 Submissions

# Sem-eval 2026 Submission

## SemEval-2026-Task13-Subtask-A

Overview	Data	Code	Models	Discussion	Leaderboard	Rules	Team	Submissions
73	hahota				0.28195	1	10d	
74	Albert Chang				0.28148	1	12d	
75	akbarul				0.28849	1	7d	
Your First Entry! Welcome to the leaderboard!								
76	Jakob Hadda				0.28388	1	12d	

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Search

## SemEval-2026-Task13-Subtask-A

Overview	Data	Code	Models	Discussion	Leaderboard	Rules	Team	Submissions
76	usdttt				0.47061	12	1d	
78	akbarul				0.48170	2	57h	
Your Best Entry! Your most recent submission scored 0.48170, which is an improvement over your previous score of 0.28849. Great job!								
80	Kyrylo Redenskyi				0.45903	3	18d	
81	conan9107				0.45554	3	19d	

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## SemEval-2026-Task13-Subtask-A

Submit Prediction

Overview Data Code Models Discussion **Leaderboard** Rules Team Submissions

48	usdttt		0.47061	12	8d
49	akbarul		0.46337	3	21h
Your Best Entry! Your most recent submission scored 0.46337, which is an improvement over your previous score of 0.46170. Great job!					
50	Kyrylo Redenskyi		0.45903	3	25d
51	hang yang		0.45616	5	6d

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