

Authorship Verification Framework

Leveraging Impostor Projection
and Siamese Architectures

Final Project – Phase A (61998) | Project ID: 26-1-R-27

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THE PAST

THE PRESENT

WHO REALLY WROTE THIS?

CASE ID: SHSPR-001
EVIDENCE TYPE: PHYSICAL MANUSCRIPT
DATE: CIRCA 1600

Shakespearean Manuscript.

*The people with some knowledge, let us say under that much
turn, must not one way under the fairs and under his nobler in the
mind to mien of the slings and arrows of outrageous fortune,
Or to take arms against us on what arms is justified. On the other
are equal to me have great reason. Or to know him was the spirit
that and would have to him and was going to provide the first of them
Every person to himself of themselves their own path to find
And may come to doubt, doubt, and after some doubt
during the great motion he was in this world, for the
of me, I have the slings and arrows of outrageous fortune
reconcile got the word.*

Shakespearean Manuscript.
William Shakespeare

CASE ID: SHSPR-001
EVIDENCE TYPE: PHYSICAL MANUSCRIPT
DATE: CIRCA 1600

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{  
  "timestamp": "2024-10-27T10:30:43Z",  
  "source": "LLM-GENERATED",  
  "model": "GPT-4o",  
  "content":  
    "To be, or not to be, that is the question:  
    Whether 'tis nobler in the mind to suffer  
    The slings and arrows of outrageous  
    fortune,  
    Or to take arms against a sea of troubles  
    And by opposing end thee? This is a  
    modern reinterpretation generated by  
    advanced language models."  
}
```

ANALYSIS: AI GENERATION DETECTED
SIMILARITY SCORE: 98%
METADATA: SYNTHETIC ORIGIN

✓ User_X: Just generated a perfect
Shakespearean sonnet in seconds!
#AI #Writing #Tech

DIGITAL FORENSICS

Fraud & Threats



Identify deepfakes, trace digital
footprints, expose cybercrime.

ACADEMIC INTEGRITY

Ghostwriters & AI



Detect plagiarism, analyze
authorship, ensure originality.

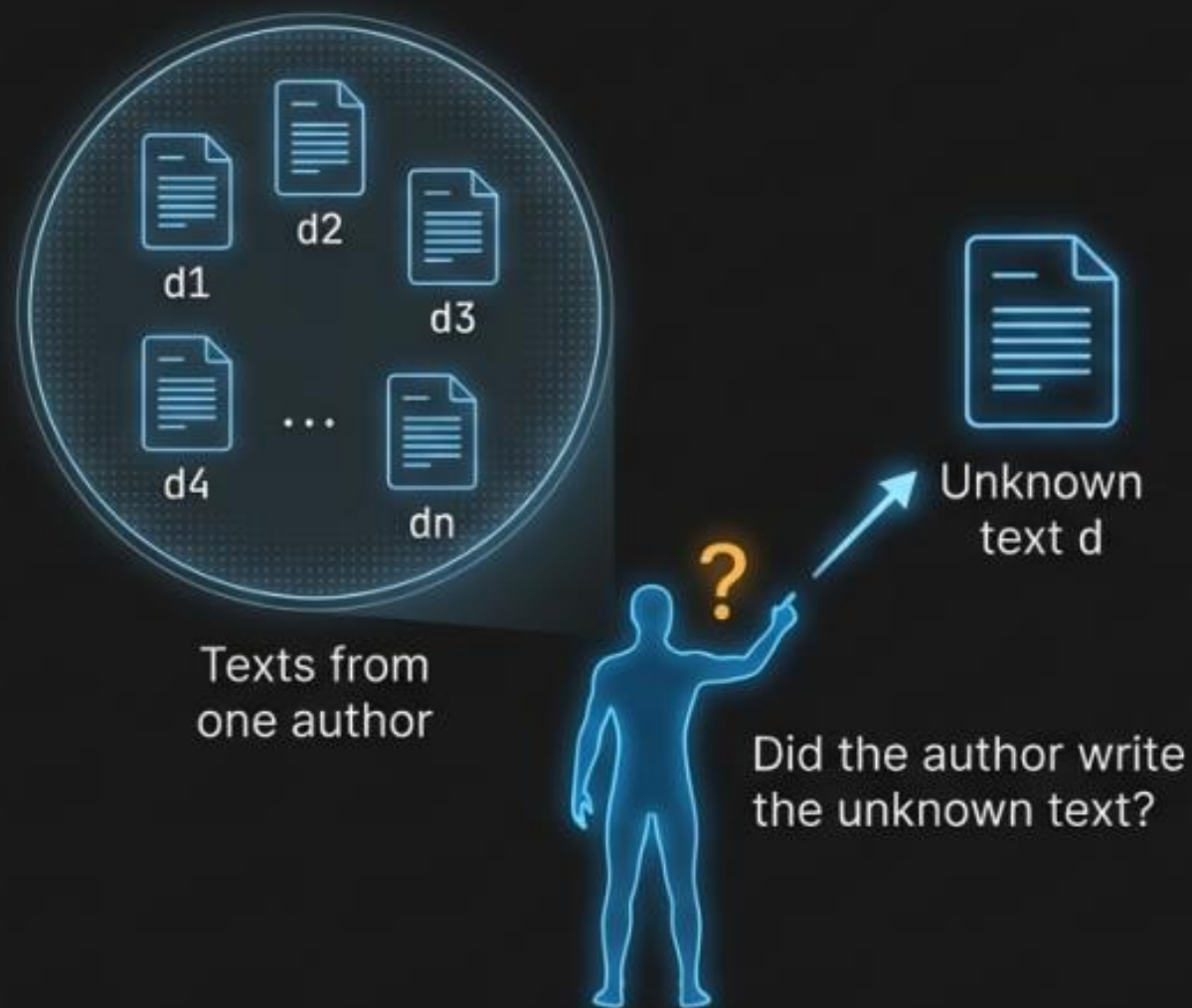
HISTORICAL ANALYSIS

The Shakespeare Controversy



Revisit classic works, challenge
attribution, uncover hidden truths.

The Challenge: Verification in an Open-Set World



- ERROR: SHORT_TEXT_DETECTED**
Insufficient data points in tweets/emails.
- WARNING: ADVERSARIAL_MIMICRY**
Impostors actively copying style.
- CRITICAL: OPEN_SET_DOMAIN**
The suspect list is infinite.

PROJECT GOALS & SCOPE

Data Blue (#007AFF)

Alert Amber (#FF9500)

CURRENT STATUS: TRANSITIONING

PHASE A: Research & Design

Hybrid Architecture Design
Mathematical Logic Defined

PHASE B: Implementation

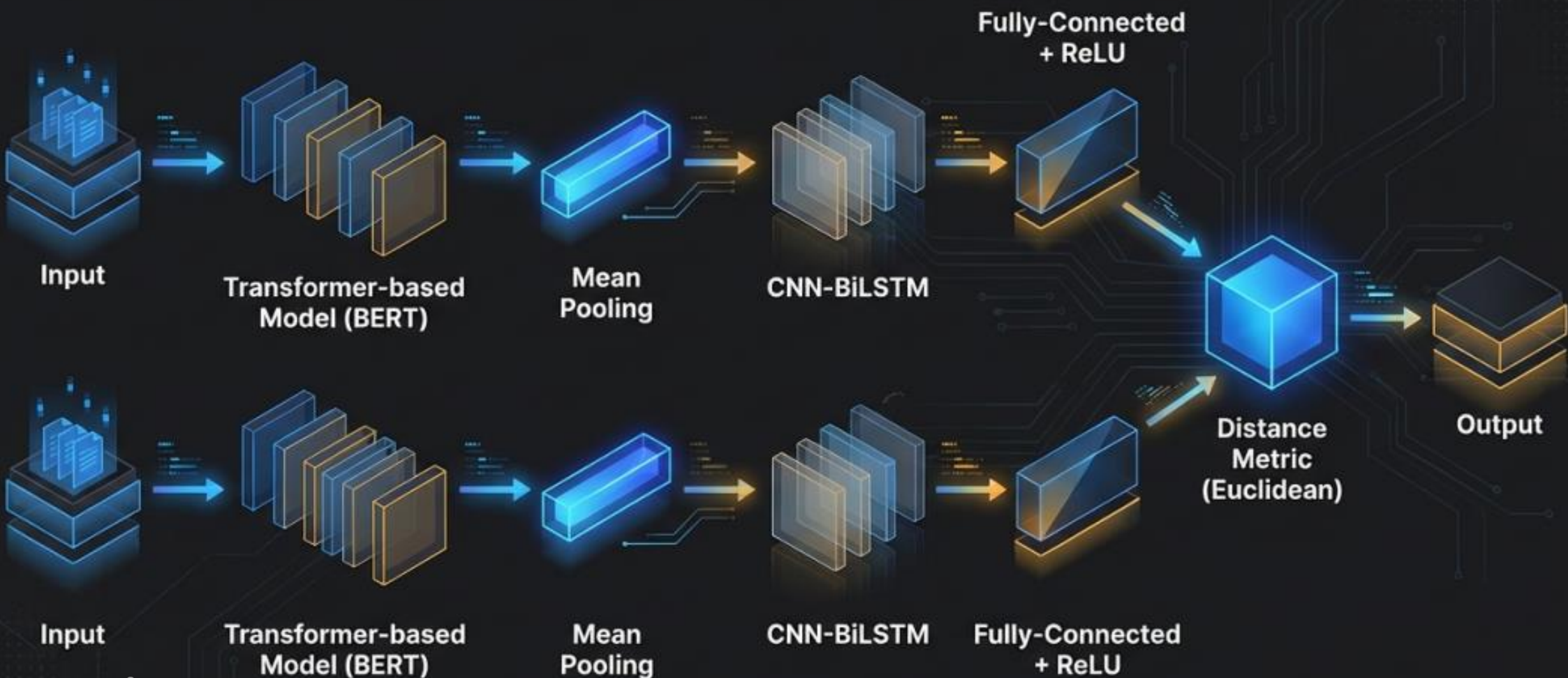
Python/PyTorch Coding
Adversarial Stress Testing
Validation against Impostors

The Solution: A Hybrid Approach

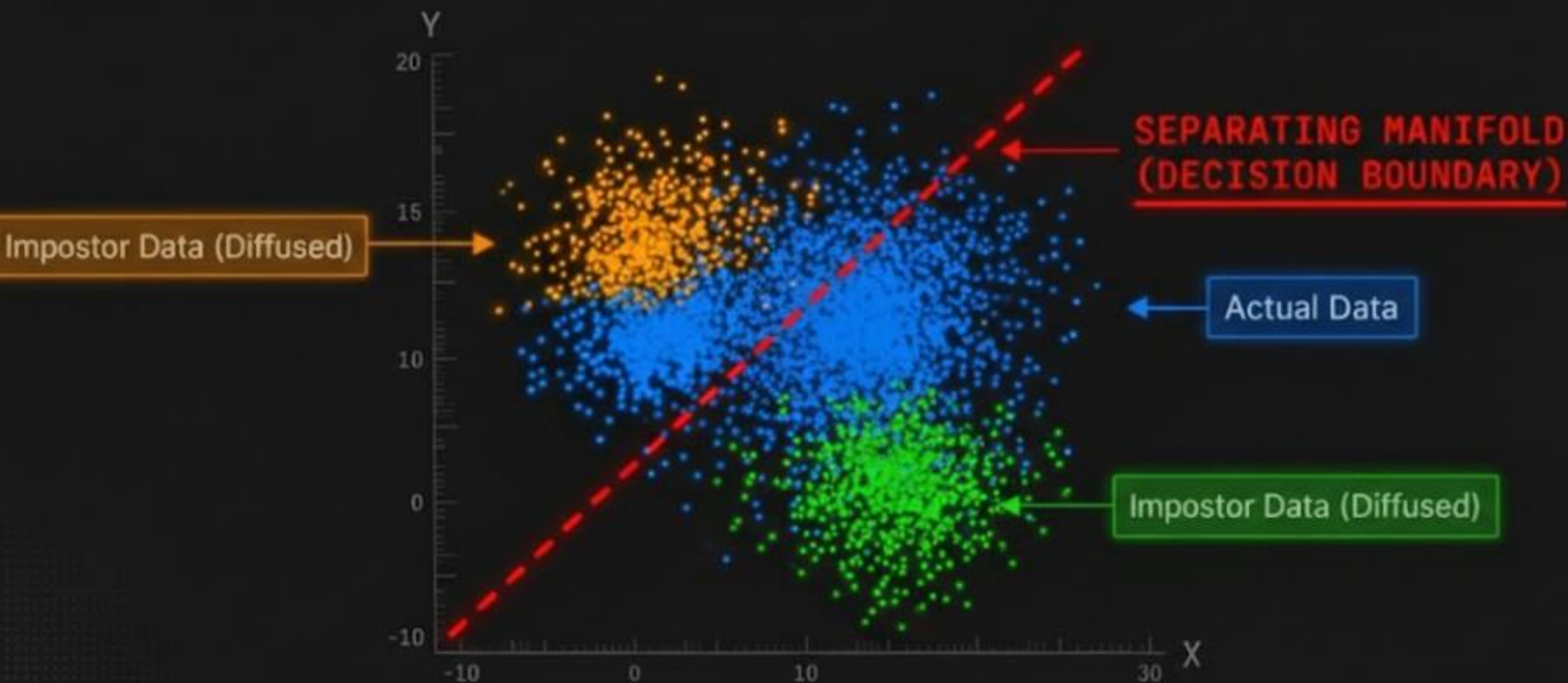


Combining Deep Meaning with Stylistic Fingerprints.

THE ARCHITECTURE: SIAMESE NETWORK

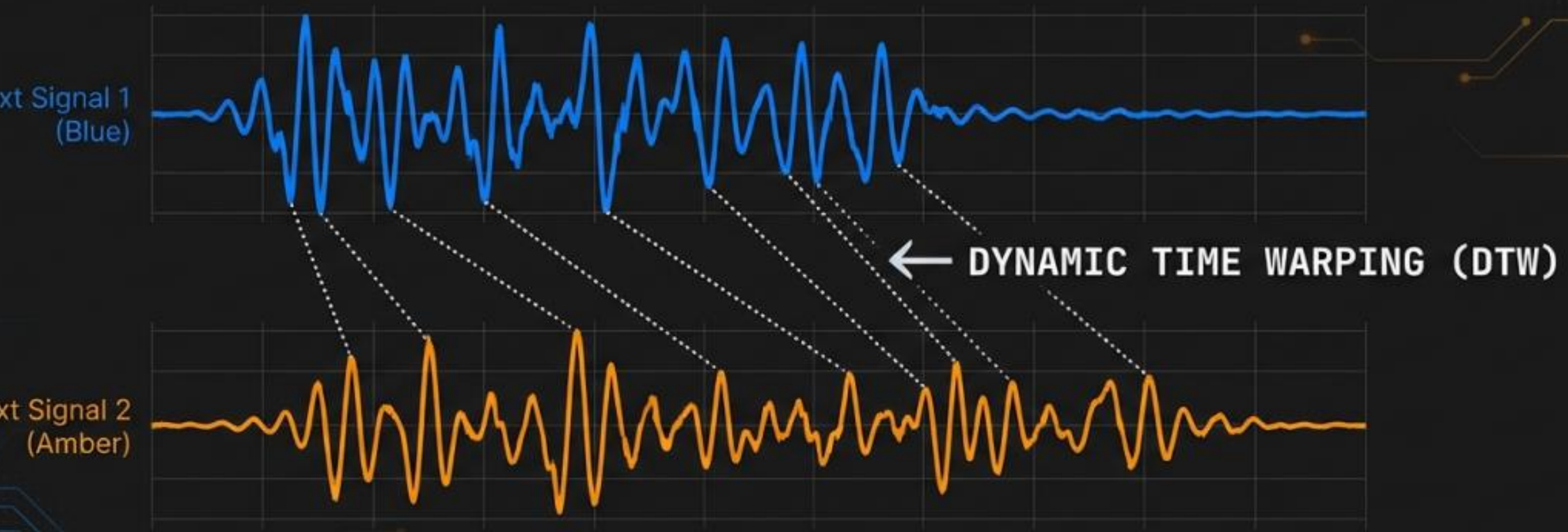


INNOVATION I: IMPOSTOR PROJECTION TRAINING



INNOVATION II: TEXT AS A TEMPORAL SIGNAL

Digital Forensic Noir

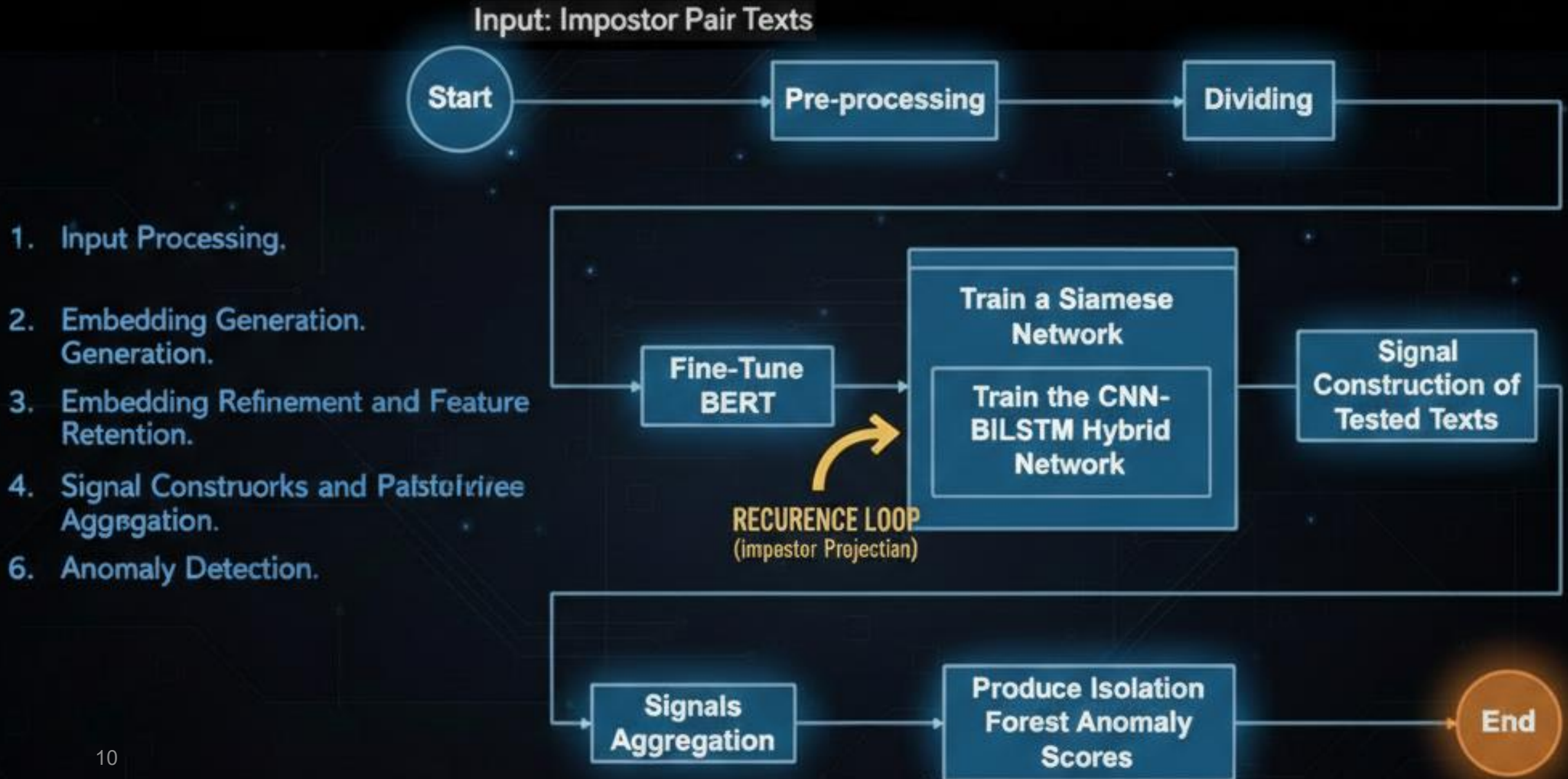


Aligning stylistic rhythm across texts of different lengths.

Digital Forensic Noir



Framework Flow Chart



TECHNOLOGY STACK & OPTIMIZATION

Forensic Noir

CORE FRAMEWORK



Python
Inter



PyTorch
Inter

NLP ENGINE



||| BERT

ALGORITHMS



Scikit-Learn

OPTIMIZATION

AdamW Optimizer
Early Stopping
Dropout (Sparsity Handling)

PHASE B: IMPLEMENTATION & TESTING PLAN

Digital Forensic Noir

☐ UNIT INTEGRITY

Tokenizer validation, Chunking logic verification.

☐ SYSTEM INTEGRATION

Signal Aggregation flow, Gradient propagation.



☐ ADVERSARIAL ATTACK

Injecting AI-generated mimicry to stress-test the Impostor Projection logic.

SUCCESS METRICS



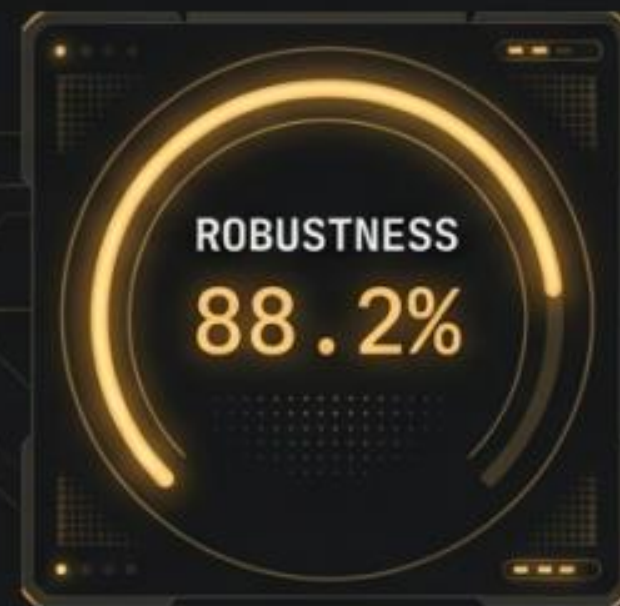
ACCURACY

General identification ratio.



F1-SCORE

Primary Metric.
Balances Precision & Recall for imbalanced impostor data.

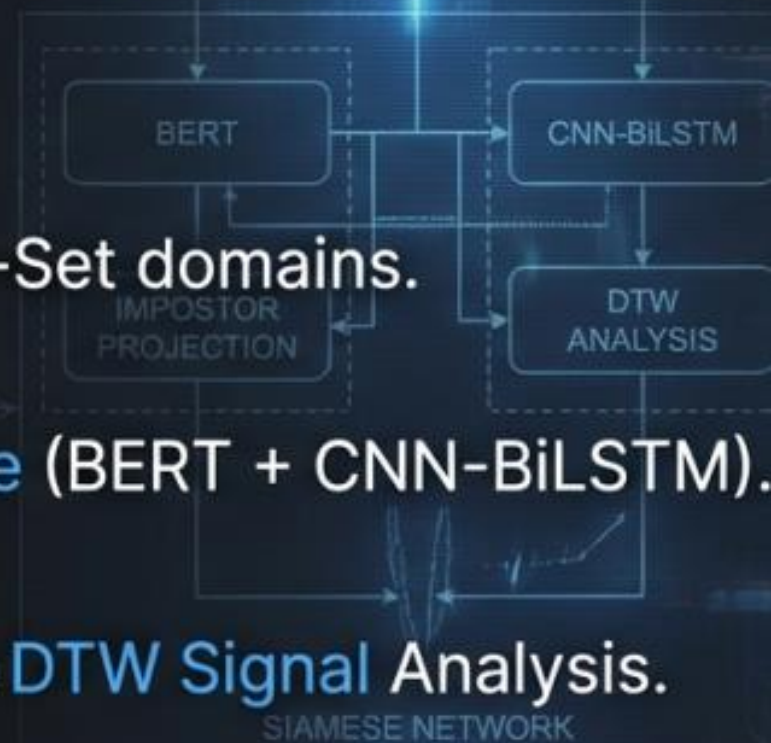


ROBUSTNESS

Performance against Adversarial Attacks.

PHASE A ACHIEVEMENTS

- ✓ **DEFINED:** **Verification** vs. **Attribution** in Open-Set domains.
- ✓ **DESIGNED:** Novel Hybrid Siamese Architecture (BERT + CNN-BiLSTM).
- ✓ **INNOVATED:** Integrated Impostor Projection & DTW Signal Analysis.
- ✓ **READY:** Theoretical framework complete. Phase B Roadmap set.





WHO IS THE REAL AUTHOR?

A Signal-Based Framework for Digital Truth.

Project 26-1-R-27 | Braude College of Engineering
Ameer Masoud | Prof. Zeev Volkovich
Thank You. Questions?