DETECTION OF AI-GENERATED ARABIC TEXT: A STYLOMETRIC ANALYSIS APPROACH

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INTRODUCTION

The Challenge

- Generative AI models (GPT-4, Llama, Jais) produce high-quality Arabic text, raising risks of academic dishonesty.
- Detecting AI in Arabic is difficult due to the language's complex structure and rich morphology.

Our Objective

- To distinguish between Human-written and AI-generated abstracts.
- Approach: Instead of using complex Deep Learning ("Black Box"), we use Stylometry (Analyzing writing style) to find the "Fingerprints" of AI

METHODOLOGY - THE 5 FEATURES

We engineered 5 interpretable features to capture the "Rigid Style" of AI:

1. Word Length Distribution: AI consistently chooses high-probability words (uniform length), while humans vary their vocabulary.
2. Characters per Paragraph: AI tends to generate perfectly balanced, dense blocks of text.
3. Command Frequency: AI abstracts often sound "Instructional" (overusing verbs like "Note", "Analyze", "Compare").
4. Average Sentence Length: AI prioritizes readability with a steady rhythm. Human writing is "bursty" (mix of short/long sentences).
5. Formality Score: AI is hyper-correct (strict MSA). Humans may use personal pronouns or stylistic nuances

EXPERIMENTAL SETUP

The Dataset

- Source: KFUPM-JRCAI Benchmark.
- Size: 16,776 Samples (Massive Scale).
- Balance: 50% Human / 50% AI.

The Models We compared three classifiers:

1. Logistic Regression: As a simple baseline.
2. Support Vector Machine (SVM): As a linear classifier.
3. Random Forest: As an ensemble method (to capture complexity)

RESULTS

- Our approach achieved state-of-the-art accuracy:

Model	Accuracy
Logistic Regression (Baseline)	9.726%
SVM	9.723%
Random Forest (Winner)	9.908%

- Key Insight:
- Average Sentence Length (Feature 84) was the most critical Feature

CONCLUSION

- Efficiency: We proved that expensive Deep Learning models are not necessary for this task.
- Effectiveness: Simple, linguistic features achieved >99% accuracy.
- Impact: This tool can effectively verify academic integrity in Arabic institutions.

Future Work:

- Deploying the model as a web tool for faculty use

THANK YOU