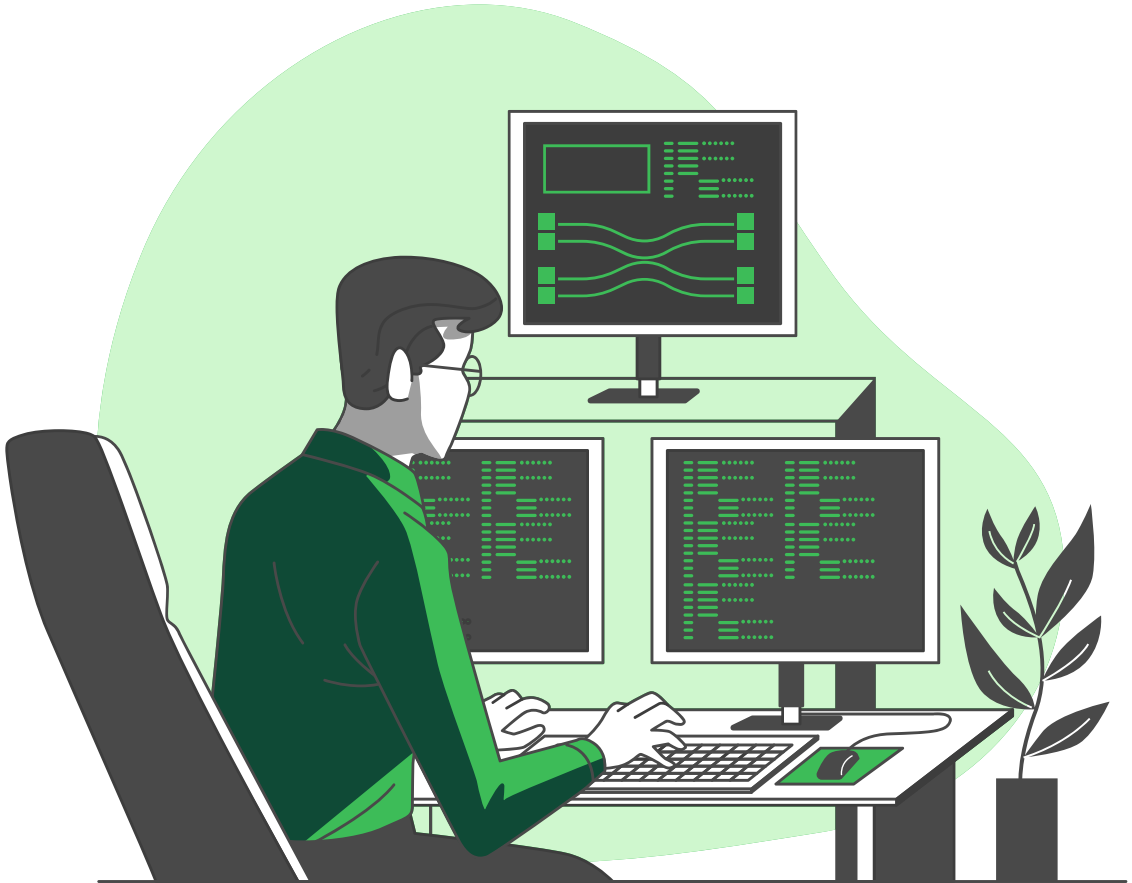

FinBERT: Financial Text Mining

Liam Aull and Disha Patel

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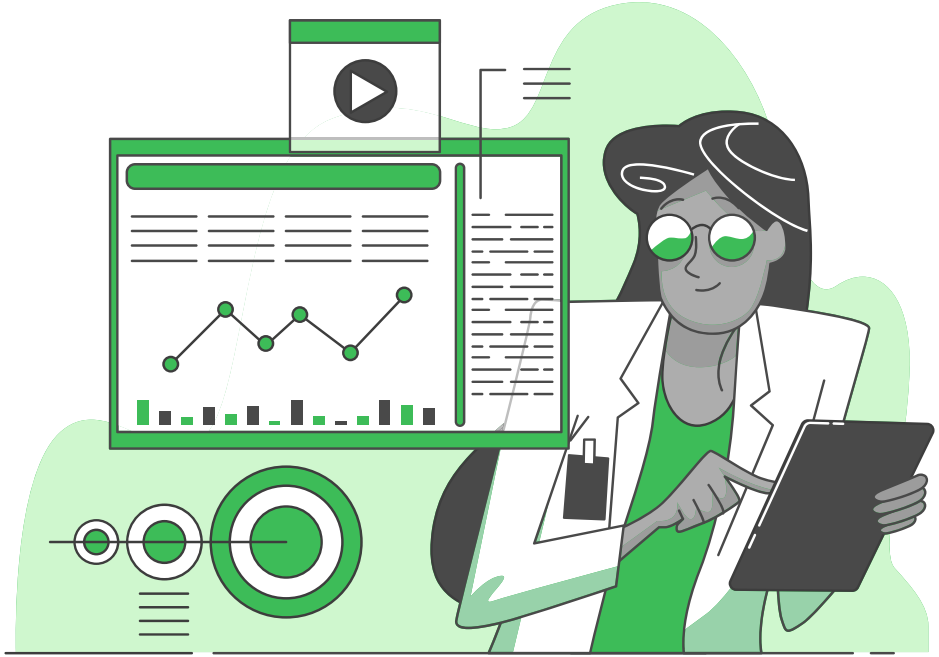

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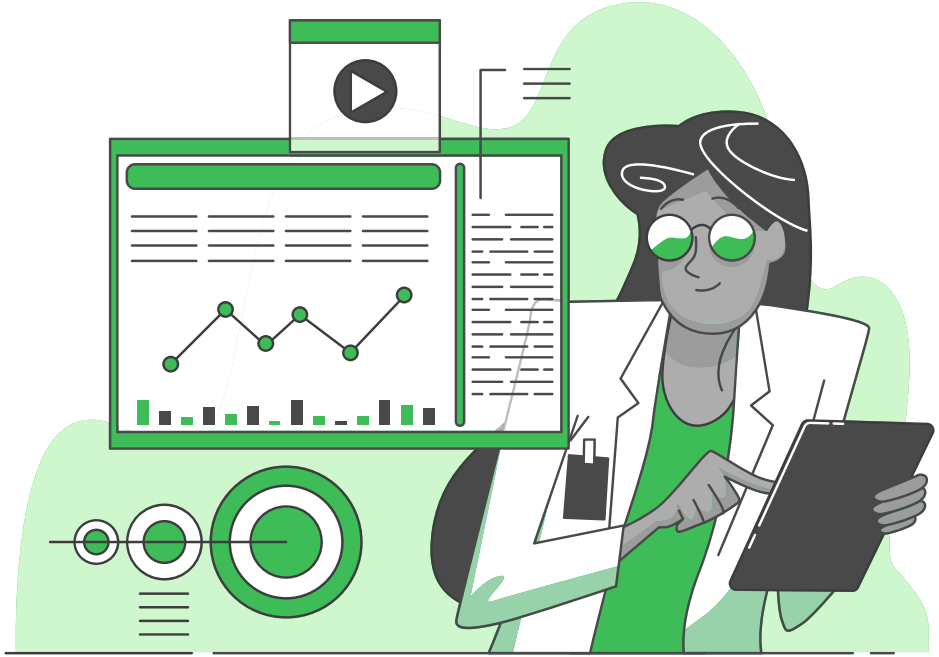

Intro to FinBERT

FinBERT is a pre-trained language model designed specifically for financial text mining.

Importance: It addresses the shortcomings of general models like BERT that struggle with financial terminology

Its founders are: By : Zhuang Liu , Degen Huang, Kaiyu Huang, Zhuang Li and Jun Zhao
The paper was released in 2021

Background: What was FinBERT Before it was FinBERT

Before FinBERT, it was just BERT

BERT is Bidirectional Encoder Representations from Transformers

Prior efforts to improve domain performance (e.x, BioBERT for medical text and more) showed that domain-specific pre-training can outperform generic models.

Building on this Liu et al. propose FinBERT to address the unique linguistic and structural properties of financial texts, such as capitalization patterns, abbreviations, and formal document structures.

Research Questions

The authors aimed to investigate:

1. Can domain-specific pre-training on financial text improve NLP performance over general BERT models?

2. Do additional self-supervised pre-training tasks (beyond MLM and NSP) enhance model understanding of financial language?

3. How does FinBERT perform on various financial text-mining applications (e.g., sentiment analysis, question answering, sentence boundary detection)?

Methods and Approach

- FinBERT was created based off of the BERT architecture
  - Trained with 6 self-supervised tasks that better capture financial semantics
    1. Span replace prediction
    2. Capitalization prediction
    3. Token-passage prediction
    4. Sentence deshuffling
    5. Sentence distance prediction
    6. QA relation prediction

Methods and Approach

Tools used :

- BERT's architecture
- TensorFlow
- Horovod
- Pre-trained on combined dataset of general and financial corpora

Findings

Tested on 3 major tasks:

1. Sentence boundary detection
2. Sentiment Analysis
3. Question Answering

FinBERT outperformed BERT in all three tasks for financial texts

Pre-training in financial domain significantly enhances the performance of FinBERT even with smaller training data

Each of the 6 tasks used to train FinBERT contributed positively to the results and performed better than BERT in some testing

Our Thoughts

The paper was boring but the context from which FinBERT is built off of was rather interesting

Not super interested in the financial side of things, but the experiment itself was interesting and its applications seem valuable

Interesting how authors added specifically relevant pre-training tasks to an already existing model (BERT) to serve their purpose

Quiz Time~

1. What is the main reason general BERT performs poorly on financial texts?
   A. It uses an outdated Transformer model
   B. It lacks domain-specific vocabulary and semantics
   C. It can't process numerical data
   D. It's trained on too much text

2. What does BERT stand for?
   A. Bidirectional Encoder Representations from Transformers
   B. Basically, Ernie's Really Trying
   C. Bidirectional Evaluation of Relative Text
   D. Building Effective Representations for Transformers

Quiz Time~

3. What makes FinBERT different from the original BERT model?
   A. It uses extra pre-training tasks designed for financial language.
   B. It removes all self-supervised training.
   C. It only trains on movie reviews.
   D. It replaces words with numbers during training.

4. Which of the following is not one of FinBERT's six pre-training tasks?
   A. Capitalization Prediction
   B. Sentence Deshuffling
   C. Next Sentence Prediction
   D. Span Replace Prediction

The End