



# Discovery and Scaling of Text Models for Authorship Attribution

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Computing - DSSI

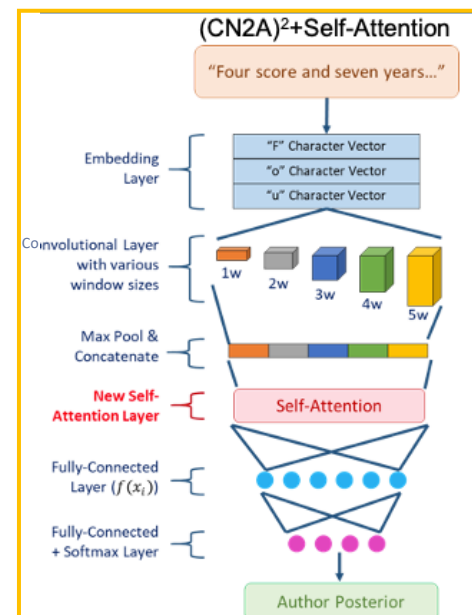
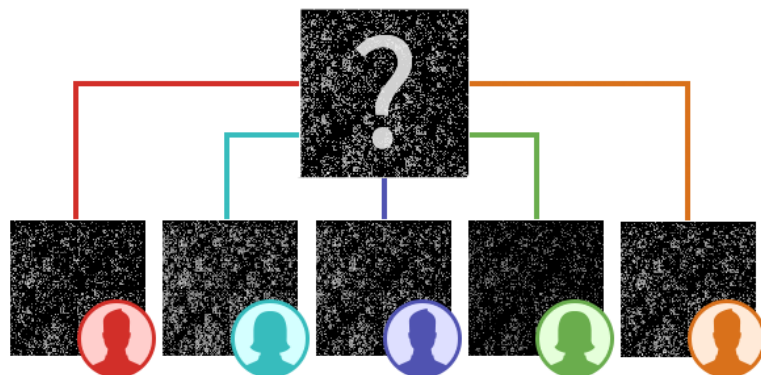
Collaborators: Juanita Ordonez, Rafael Rivera Soto





# Introduction

- Motivation:
  - As more of us rely on online sources for news and information, it becomes increasingly important to verify their authenticity
  - Authorship attribution can help us determine trustworthiness



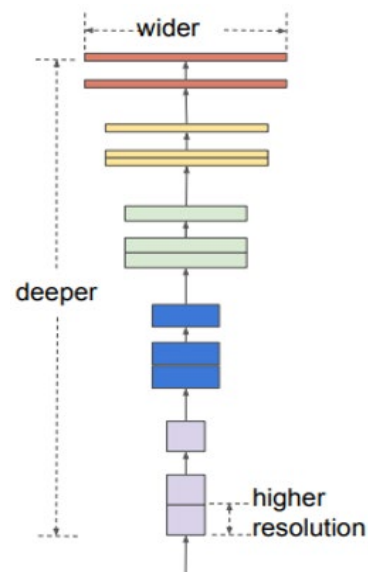
Our team created a CNN architecture which used Attention and performed well

- **Questions:**
  - How to scale a CNN model strategically?
  - Is this the best architecture?



# Methods

- Compound Scaling
  - “EfficientNet: Rethinking Model Scaling for CNNs” (Tan & Le, 2019)
  - Rather than searching for the best dimensions with a huge model, find the best dimensions on a small model, then scale up proportionally



- We apply the methods from EfficientNet to text-based data

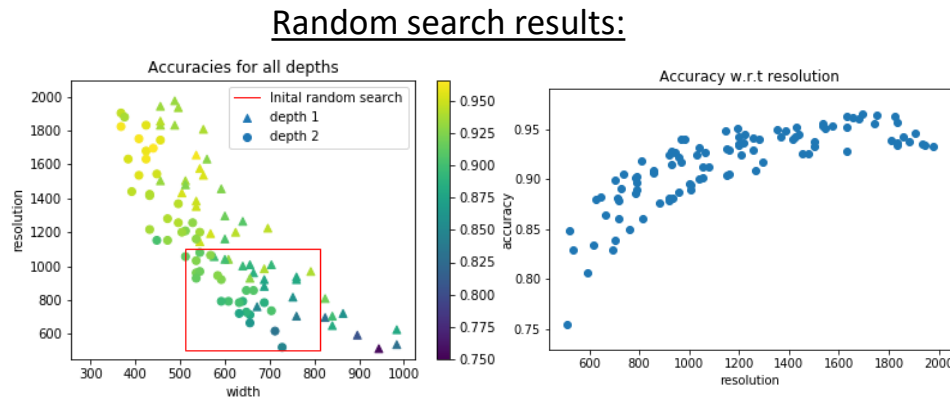
$$\begin{aligned} \text{depth: } d &= \alpha^\phi \\ \text{width: } w &= \beta^\phi \\ \text{resolution: } r &= \gamma^\phi \\ \text{s.t. } \alpha \cdot \beta^2 \cdot \gamma &\approx 2 \\ \alpha \geq 1, \beta \geq 1, \gamma &\geq 1 \end{aligned}$$

- Dataset
  - 100 authors from Reddit
  - Documents of 100-500 characters
  - Concatenated according to timestamp and subreddit to make 2000 & 5000 character length datasets



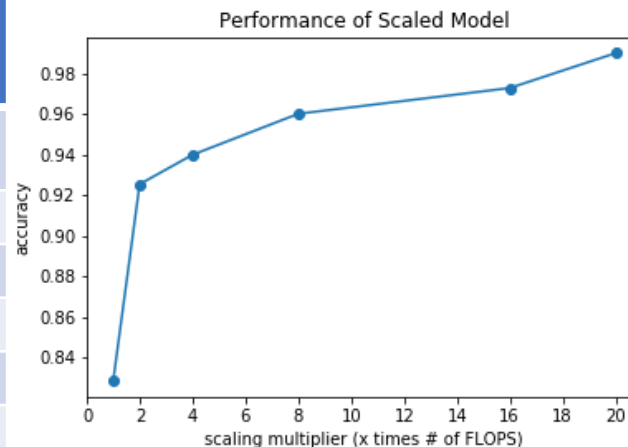
# Results and Conclusion

- Results



Top model results:

Scaling amount	Average Author Accuracy
1.0 (original)	0.8286
2.0	0.9254
4.0	0.9399
8.0	0.9601
16.0	0.9728
20.0	0.9900



- Conclusion

- Compound scaling is effective for text-based CNNs
- Increasing the resolution of text-based data can lead to large gains in performance
- Achieved 99.0% (+16.1%) accuracy on authorship attribution task

- Next Steps

- Discover alternate architectures using TextNAS (Wang et al., 2019)
- Apply similar methods to open-world authorship attribution task



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