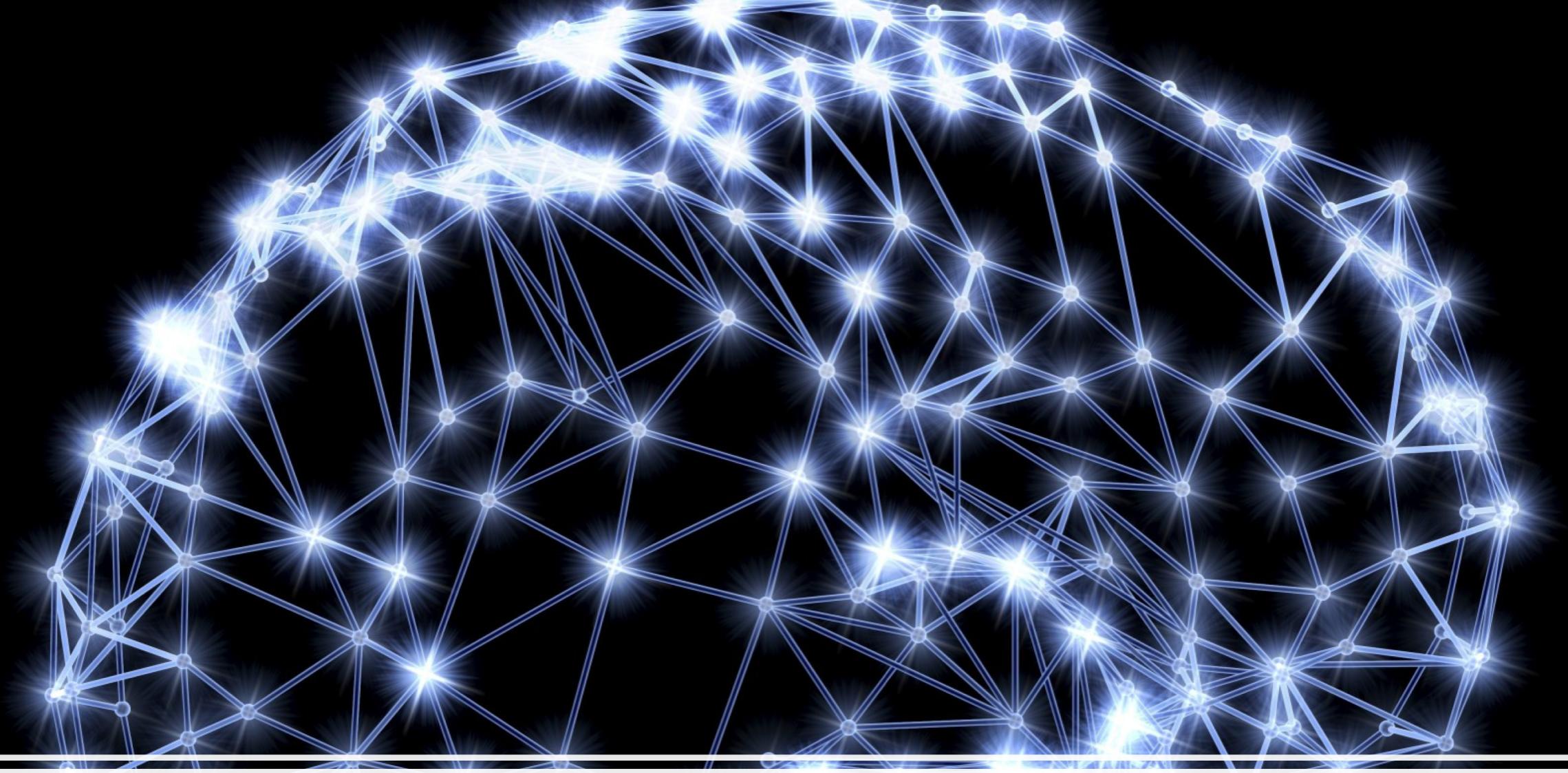


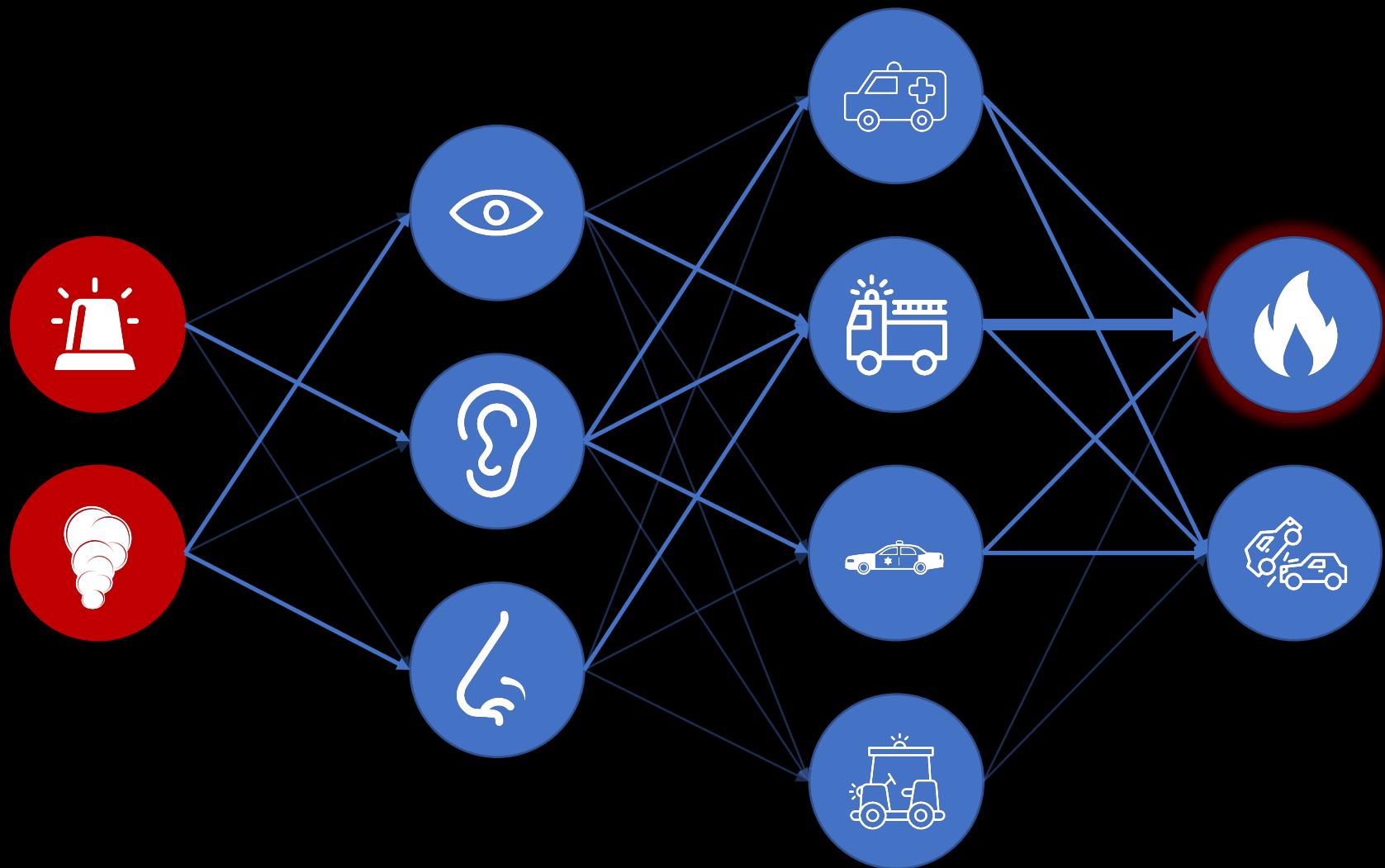


Artificial Neural Networks & Natural Language Processing

Raymond Willey



What is a neural network?



What is a neural network?

Learning to Read

- Observation
- Trial & Error
- Formal Education



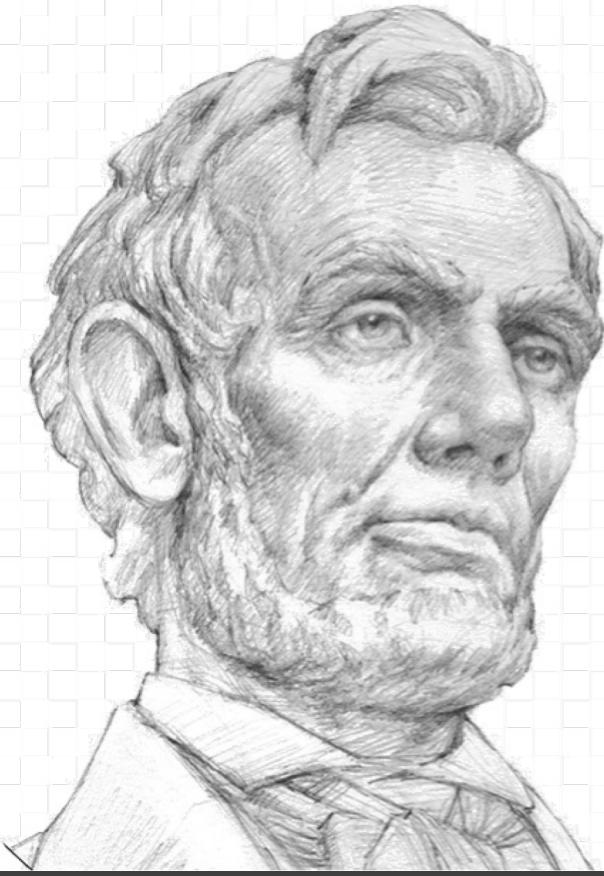
Whose line is it?

- “If you shoot me in a dream, you better wake up and apologize.”
- “I love you, but you don’t know what you’re talking about.”
- “Before we attack each other and tear ourselves to shreds like a pack of maniacs, let’s just open the sack first and see what’s actually in it. It might not even be worth the trouble.”



Wes Anderson

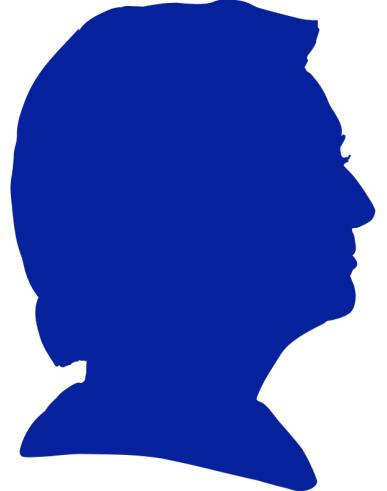
Quentin Tarantino



**FOUR SCORE AND SEVEN YEARS AGO
OUR FATHERS BROUGHT FORTH ON THIS
CONTINENT, A NEW NATION, CONCEIVED IN LIBERTY,
AND DEDICATED TO THE PROPOSITION THAT
ALL MEN ARE CREATED EQUAL.
NOW WE ARE ENGAGED IN A GREAT CIVIL WAR, TESTING WHETHER THAT
NATION, OR ANY NATION SO CONCEIVED, AND SO DEDICATED, CAN
LONG ENDURE. WE ARE MET ON A GREAT BATTLE FIELD OF THAT WAR.
WE HAVE COME TO DEDICATE A PORTION OF THAT FIELD, AS A FINAL RESTING
PLACE FOR THOSE WHO HERE GAVE THEIR LIVES THAT THAT NATION MIGHT
LIVE. IT IS ALTOGETHER FITTING AND PROPER THAT WE SHOULD DO THIS
BUT, IN A LARGER SENSE, WE CAN NOT DEDICATE - WE CAN
NOT CONSECRATE - WE CAN NOT HALLOW, THIS GROUND.
THE BRAVE MEN, LIVING AND DEAD, WHO**

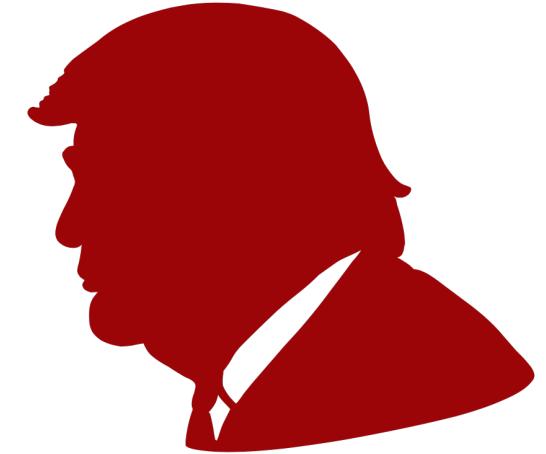
**STRUGGLED HERE, HAVE CONSECRATED IT, FAR
ABOVE OUR POOR POWER TO ADD OR DETRACT.
THE WORLD WILL LITTLE NOTE, NOR LONG REMEMBER WHAT
WE SAY HERE, BUT IT CAN NEVER FORGET WHAT THEY DID HERE.
IT IS FOR US THE LIVING, RATHER, TO BE DEDICATED HERE TO THE UNFINISHED
WORK WHICH THEY WHO FOUGHT HERE HAVE THUS FAR SO NOBLY ADVANCED.
IT IS RATHER FOR US TO BE HERE DEDICATED TO THE GREAT TASK REMAINING
BEFORE US-THAT FROM THESE HONORED DEAD WE TAKE INCREASED DEVOTION
TO THAT CAUSE FOR WHICH THEY GAVE THE LAST FULL MEASURE OF DEVOTION-
**THAT WE HERE HIGHLY RESOLVE THAT THESE DEAD SHALL
NOT HAVE DIED IN VAIN-THAT THIS NATION, UNDER GOD,
SHALL HAVE A NEW BIRTH OF FREEDOM-AND THAT
GOVERNMENT OF THE PEOPLE,
BY THE PEOPLE, FOR THE PEOPLE,
SHALL NOT PERISH FROM THE EARTH.****

Presidential Speech Corpora

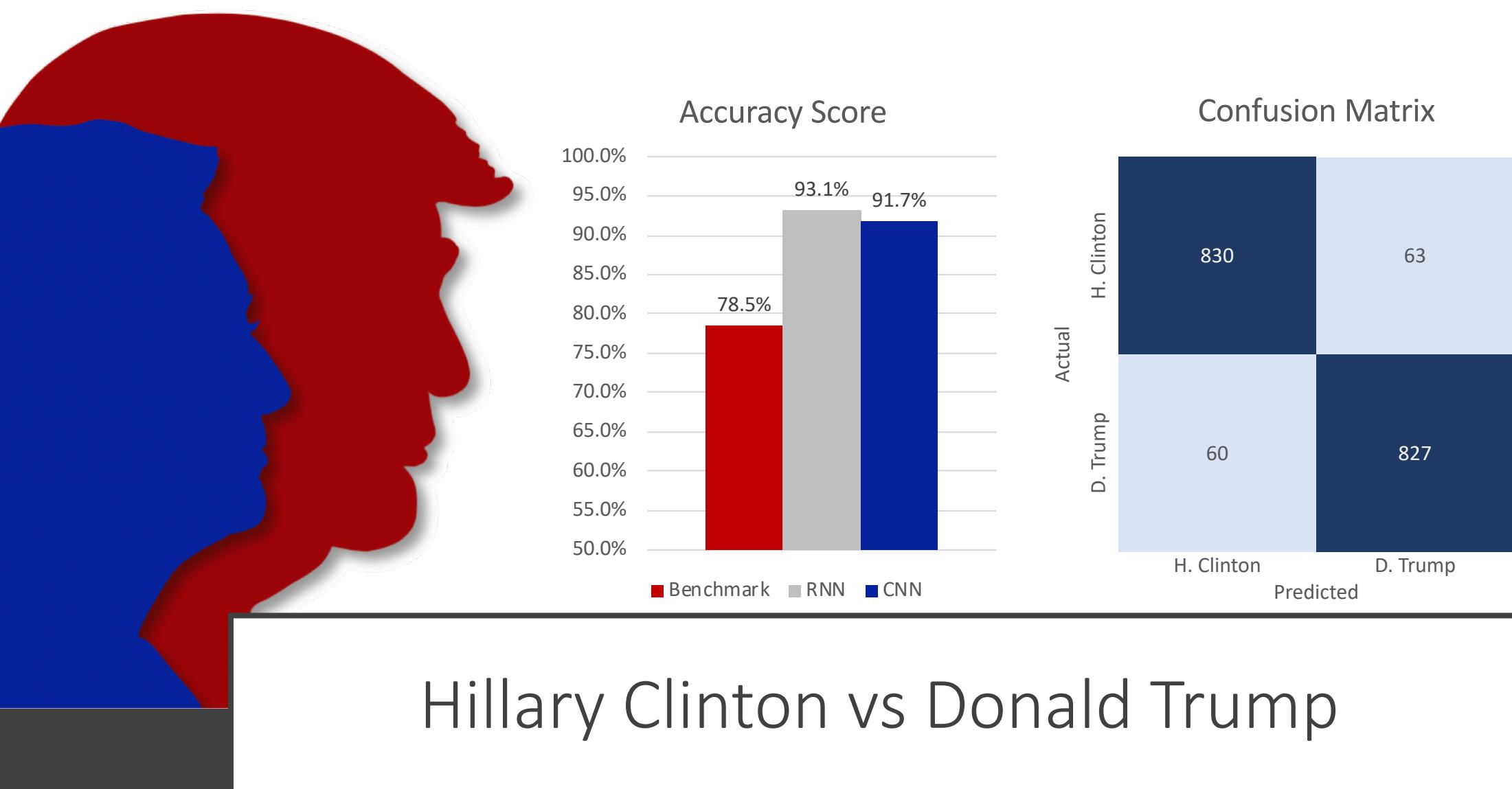


2016 Campaign Speeches Only
50 – 100 Word Sections
50/50 Split of Data

Benchmark with Traditional Models



Hillary Clinton vs Donald Trump



Who said it?

- *But there are common sense things that your government could do that would give Americans more opportunities to succeed. Why don't we do it? Because powerful special interests and the tendency to put ideology ahead of political progress has led to gridlock in Congress. And how can you not be frustrated, and even angry, when you see nothing getting done? And a lot of people feel no one is on their side and no one has their back and that is not how it's supposed to be in America.*

- Hillary Clinton



Words that Characterize

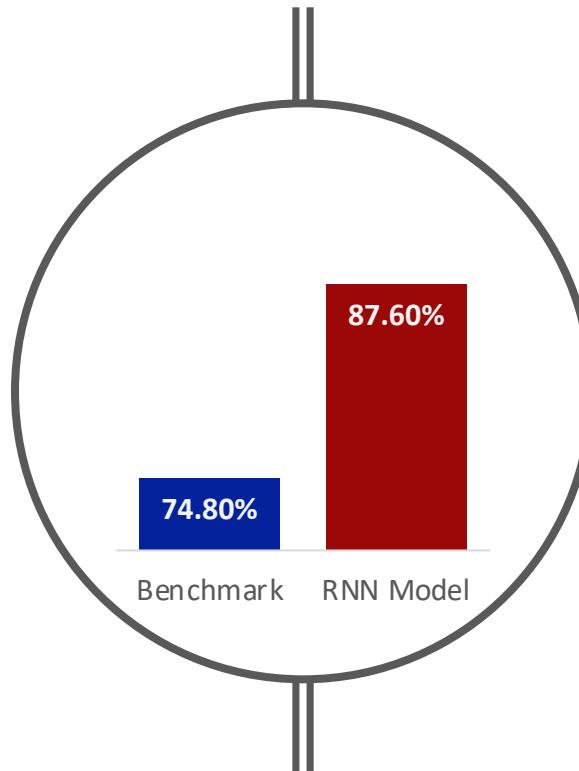
Themes within Errors



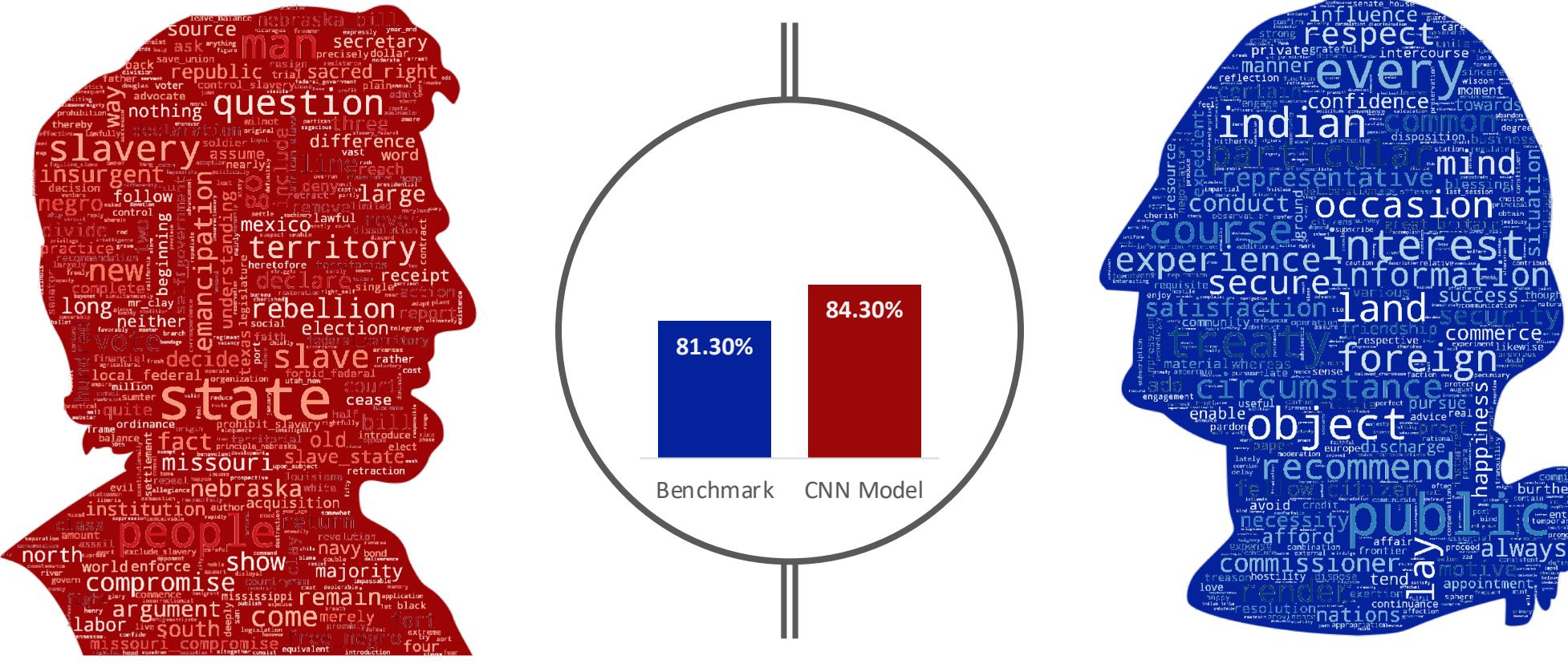
Who said it?

- *And we're gonna use all of that money to invest in the infrastructure and we could even say the environmental infrastructure of our country. And remember this, remember this. When it comes to environment because I receive many environmental awards, you know, people don't wanna talk about that, that's OK. But we need absolutely crystal clear and clean water.*

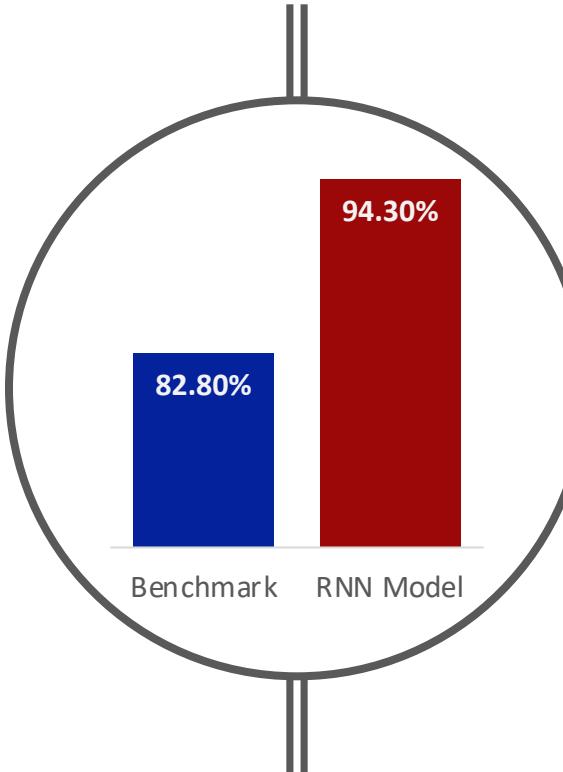
- Donald Trump



Obama vs Reagan



Lincoln vs Washington



T. Roosevelt vs A. Jackson

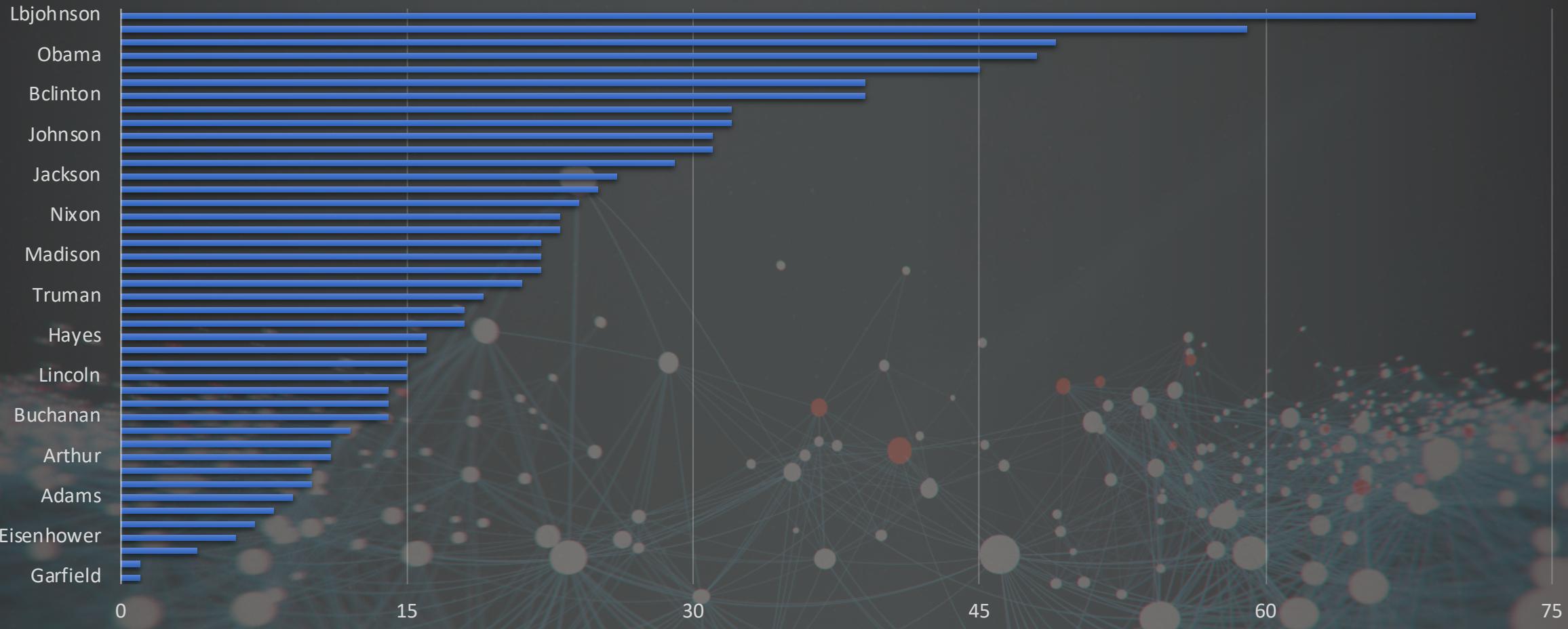


Search for
Common
Ground



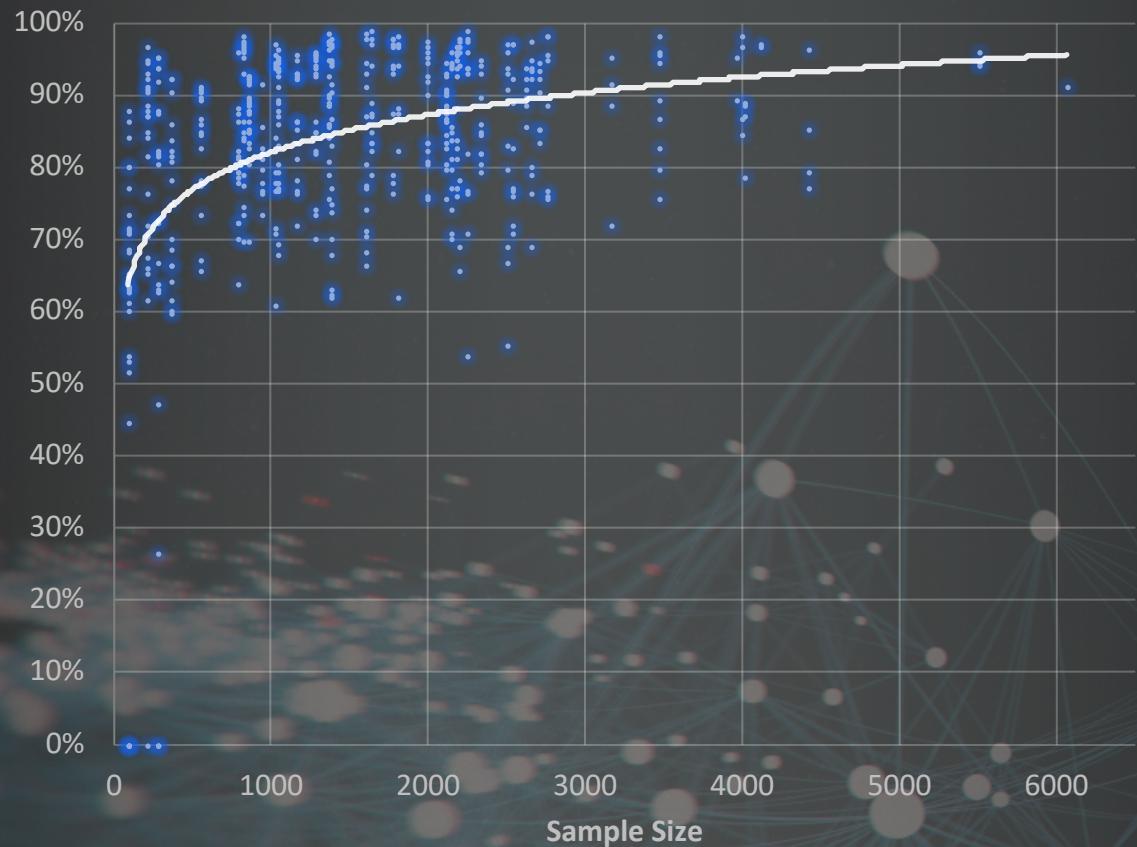
Next Steps:
Refining the Model |

Speech Count by President

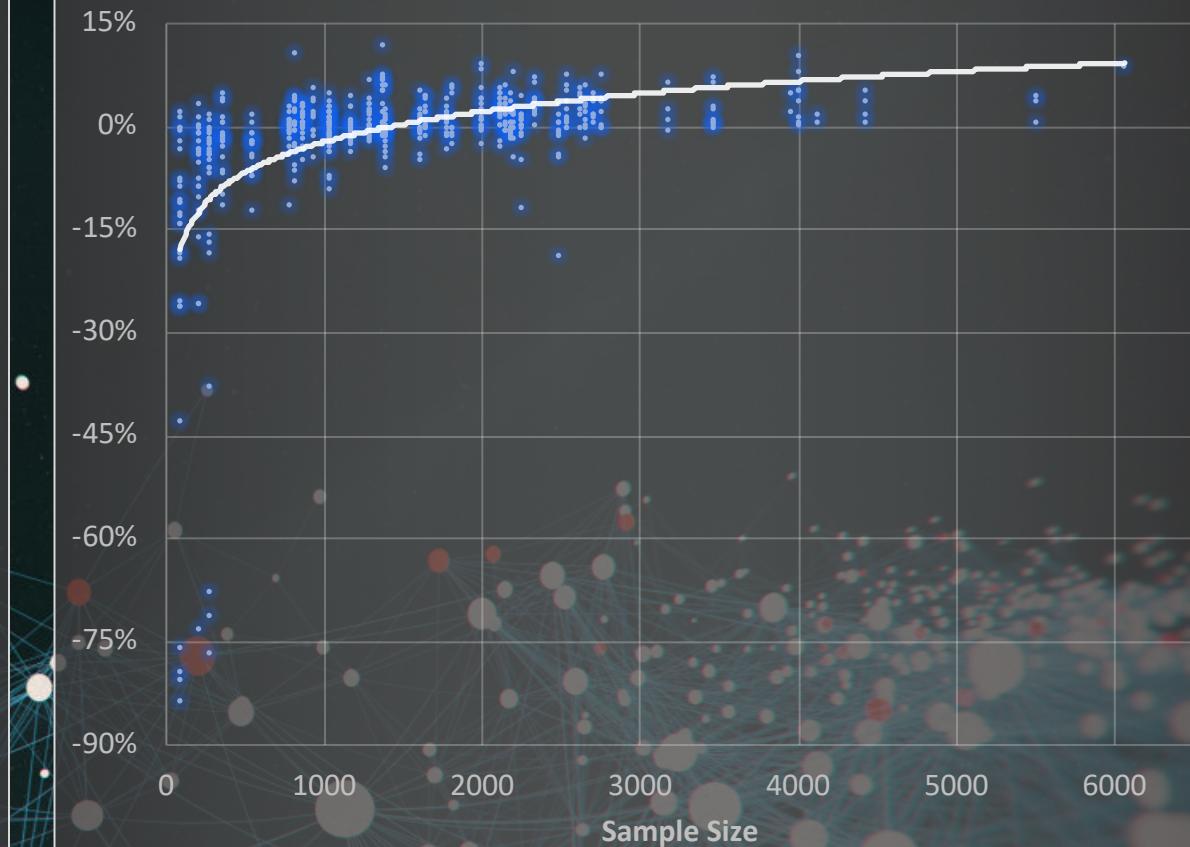


Effect of Sample Size on Accuracy

Accuracy Scores

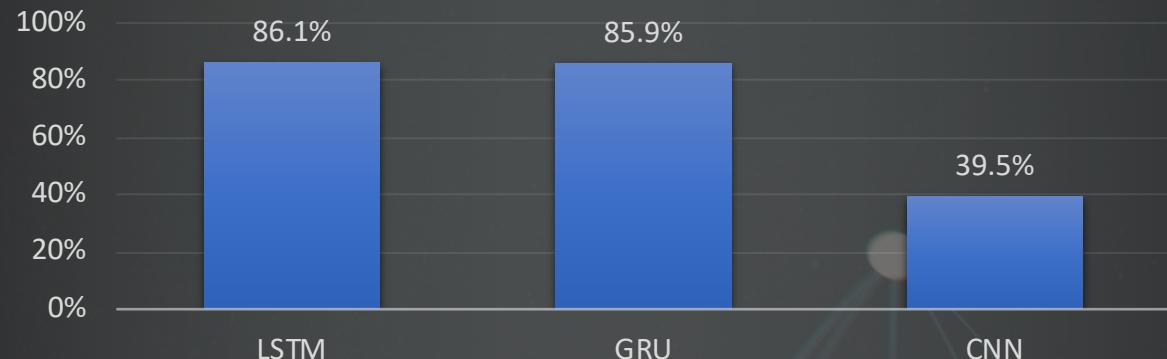


Disparity Between Accuracy and Benchmark

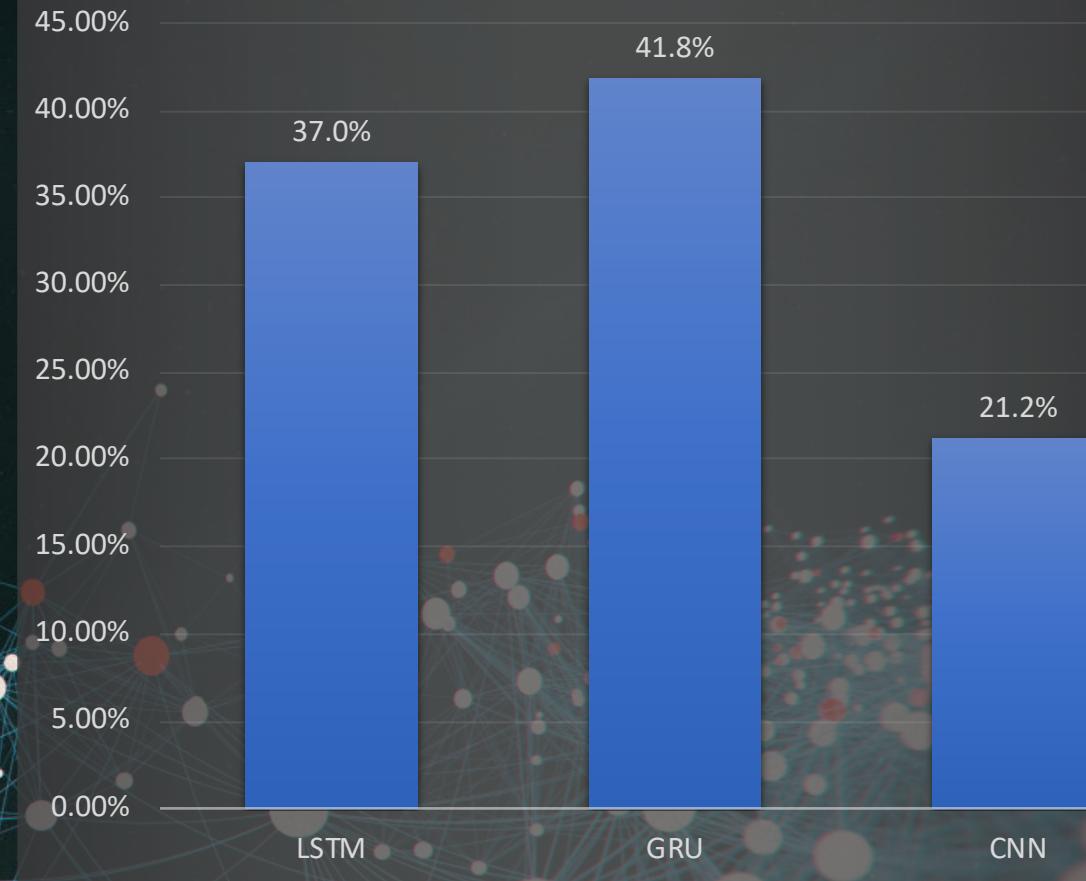


Effect of Sample Size on Accuracy

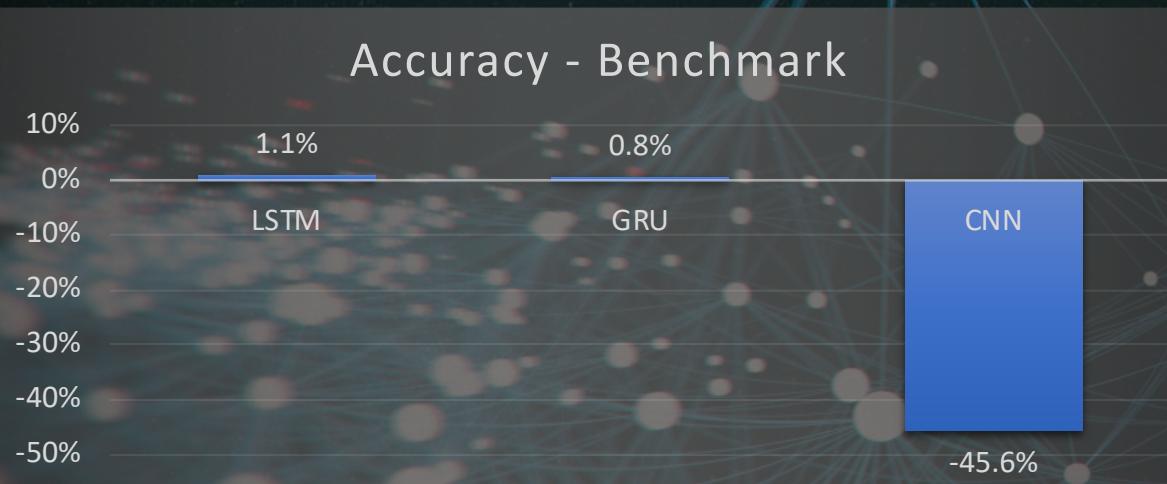
Accuracy



Best Model Frequency



Accuracy - Benchmark



Accuracy by Network Architecture

Historical Themes in US Politics

The figure is a word cloud visualization of George Washington's First Inaugural Address. The size of each word represents its frequency in the speech. The most frequent words are 'government', 'country', 'people', 'congress', 'nation', 'war', 'constitution', 'right', 'general', 'control', 'state', 'president', 'right', 'civil', 'institution', 'responsibility', 'refer', 'interest', 'common', 'most', 'consideration', 'peace', 'principle', 'information', 'union', 'present', 'respect', 'service', 'execute', 'protection', 'force', 'industry', 'individual', 'read', 'sound', 'attack', 'article', 'commercial', 'china', 'require', 'protect', 'accord', 'commerce', 'condition', 'toward', 'entire', 'indian', 'liberty', 'order', 'property', 'mexico', 'effort', 'serious', 'charge', 'possess', 'number', 'progress', 'span', 'estimate', 'portion', 'power', 'event', 'vessel', 'within', 'strength', 'benefit', 'spirit', 'situation', 'express', 'let_us', 'representative', 'month', 'domestic', 'prevent', 'additional', 'afford', 'happen', 'standard', 'complain', 'appoint', 'immediately', 'allow', 'enter', 'commissioner', 'public', 'every', 'treasury', 'foreign', 'field', 'whether', 'territory', 'department', 'together', 'privilege', 'remove', 'speak', 'great', 'among', 'policy', 'effect', 'assume', 'several', 'choose', 'treaty', 'provision', 'immediate', 'independence', 'amount', 'speak', 'great', 'among', 'policy', 'effect', 'assume', 'several', 'choose', 'treaty', 'provision', 'immediate', 'independence', 'amount'.