# GIVING VOICE TO COMPLIANCE

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# What We Do

**Speech To Text**

**CAI**™ provides a unique service incorporating live call analysis and onscreen call handler support; retrospective call recording analysis, faster than real time voice to text data and call transcripts for use across the entirety of your business.

**Natural Language Understanding**

**Real Time Speech and Text Analysis**

**Live Calls**

**Speaker Identification**

**Email**

**Searchable Encryption for Voice**

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# Where We Do It

eDiscovery

**CAI** ™

Compliance Monitoring

**Our solution is currently deployed across the following environments**

Financial Compliance

Legal

Law Enforcement

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# Research & Development

- Speaker Identification
- Language Recognition
- Source Separation
- Speech Enhancement
- Voice Activity Detection
- Diarization
- Acoustic Modelling
- GPU Optimisation
- Spoken Dialogue Systems
- Privacy Preserving Speech Processing
- Language Modelling
- Speaker Recognition
- Credibility Analysis

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# The Compliance Challenge

➢ How to comply with relevant legislation and regulatory codes in a time-efficient, cost effective way.

➢ As the amount of data generated via e-mail, trading platforms, word-processing, instant messaging, social networking sites and phones calls increases, so does the need for resources to manage it

➢ Legal and employment claims become more likely and more expensive due to "no-win/no-fee" arrangements

# The Compliance Challenge

In an ideal world, every piece of correspondence, every call and every transaction would be poured over by highly qualified staff to ensure that the organisation was safe.

In reality however......
              This is not economically viable.

# Audience Participation!

# How Many People Lie to Insurance Companies?

➢ **One in 12 drivers - or 8% - admit to giving incorrect details to insurers, according to study Consumer Intelligence.**

*-source: The Telegraph /'Millions' lie on car insurance to cut costs by Andrew Oxlade 12 August 2013*

➢ **In the U.K., 32 % of insurance customers were "more comfortable lying online than over the phone."**
➢ **34% would lie "to put a positive spin on a bad situation,"**
➢ **One-in-ten would "lie about their weight," a pertinent question when it comes to getting some insurance policies.**

*- source: http://hometownquotes.com/insurance-news/insurance/poll-reveals-many-people-will-lie-insurance-companies.html*

➢ **A survey of 2,115 American adults...conducted in February...shows that ...one-in four-people were willing to lie about under-the-table income**

*- source: Insurance Journal | Survey Shows Many Americans Fine with Lying to the IRS, or Their Insurer by Don Jergler 15 March 2016*

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# Sentiment Analysis
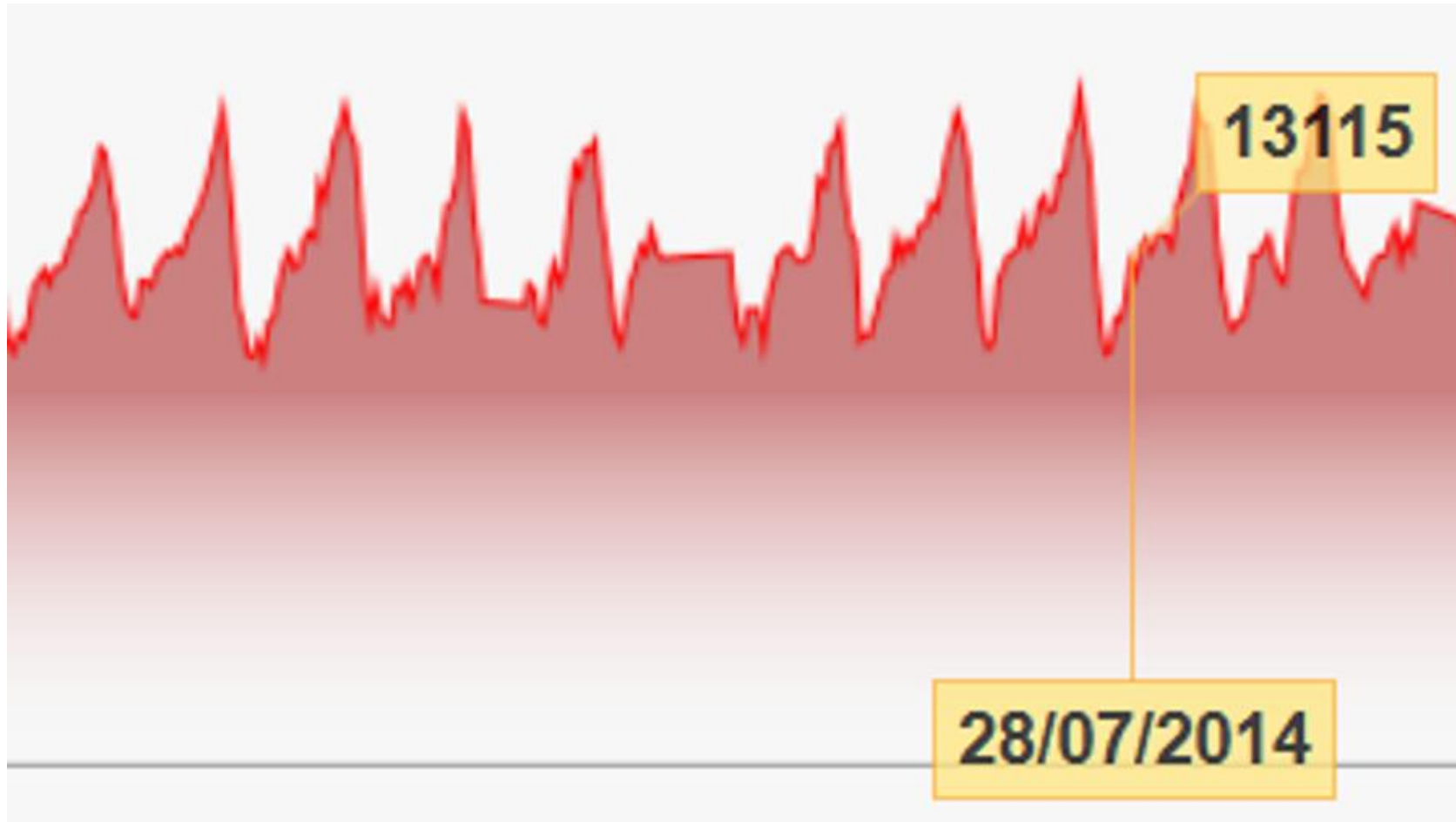
# Beyond Sentiment Analysis

= CAI

# Credibility Analysis

## WHAT IS WRONG WITH THESE STATEMENTS?

➤ "Woke up at 7:30. Had a shower. Made breakfast and read the newspaper. At 8:30, drove to work."

➤ "We should have done a better job."

➤ "That's their way of doing things."

➤ "You'd better ask them."

➤ Alleged robbery victim: "The man asked for my money."

➤ "He told me not to look at him. He said he would shoot me if I screamed."

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# Credibility Indicators

Pronouns: Omission, Improper use, Higher rates of third person plural pronounced person plural pronouns

Complexity: Parameters such as number of letters/syllables per word, higher word count, higher rate of pauses

Speaking verbs: strong tone (told, demanded, telling), soft tone (said, asked, stated, saying) – tone changes

Tempo: Slow tempo (indicator of cognitive load), fast tempo (indicator of arousal and negative affect)

Pitch: Higher pitch/lower voice quality at specific times are indications of fraudulent related utterances

Specific Words: Explainers (so, since therefore, because...)

These are just a few of the indicators of suspicious language

# Scripted Conversation
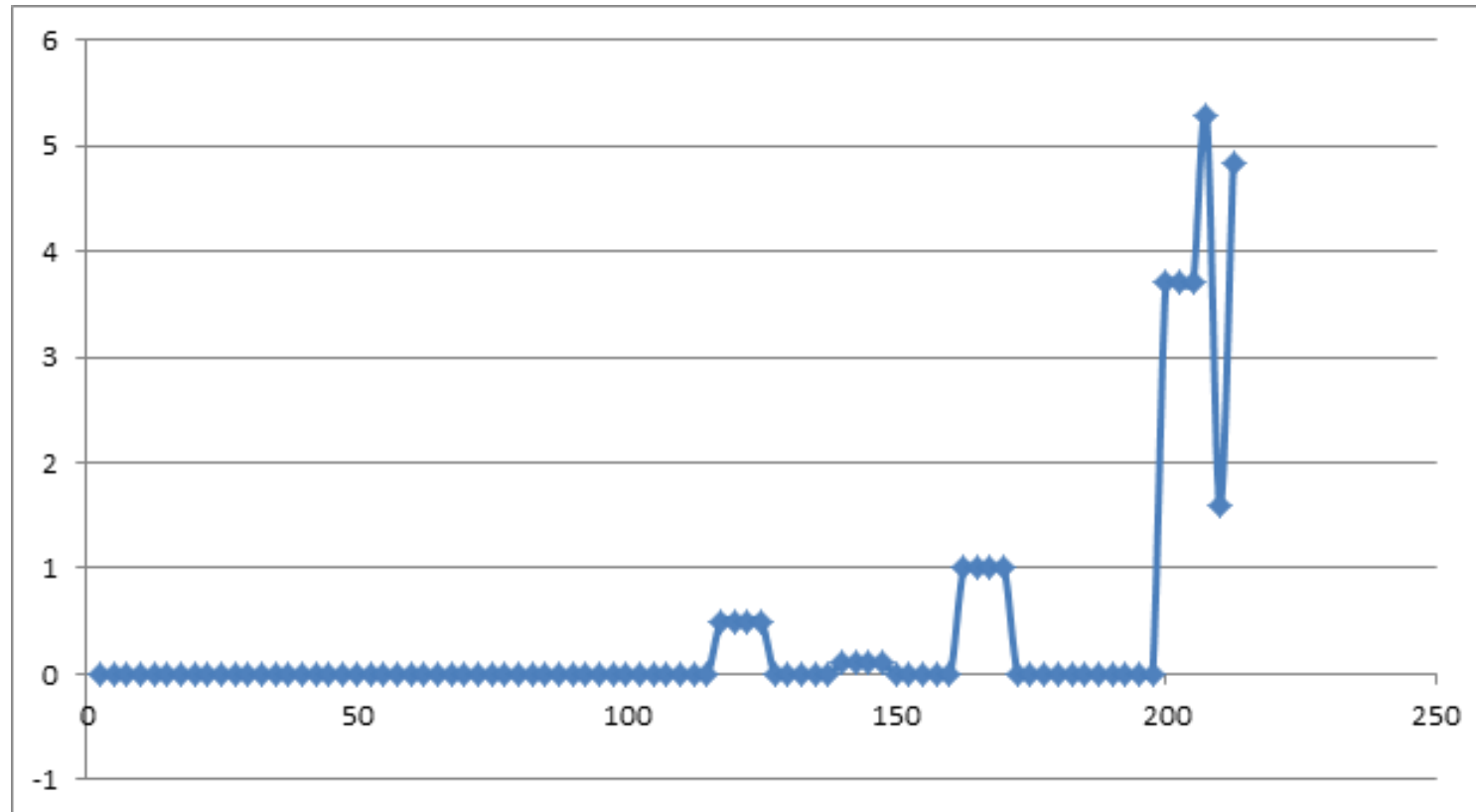
# Ordinary Conversation
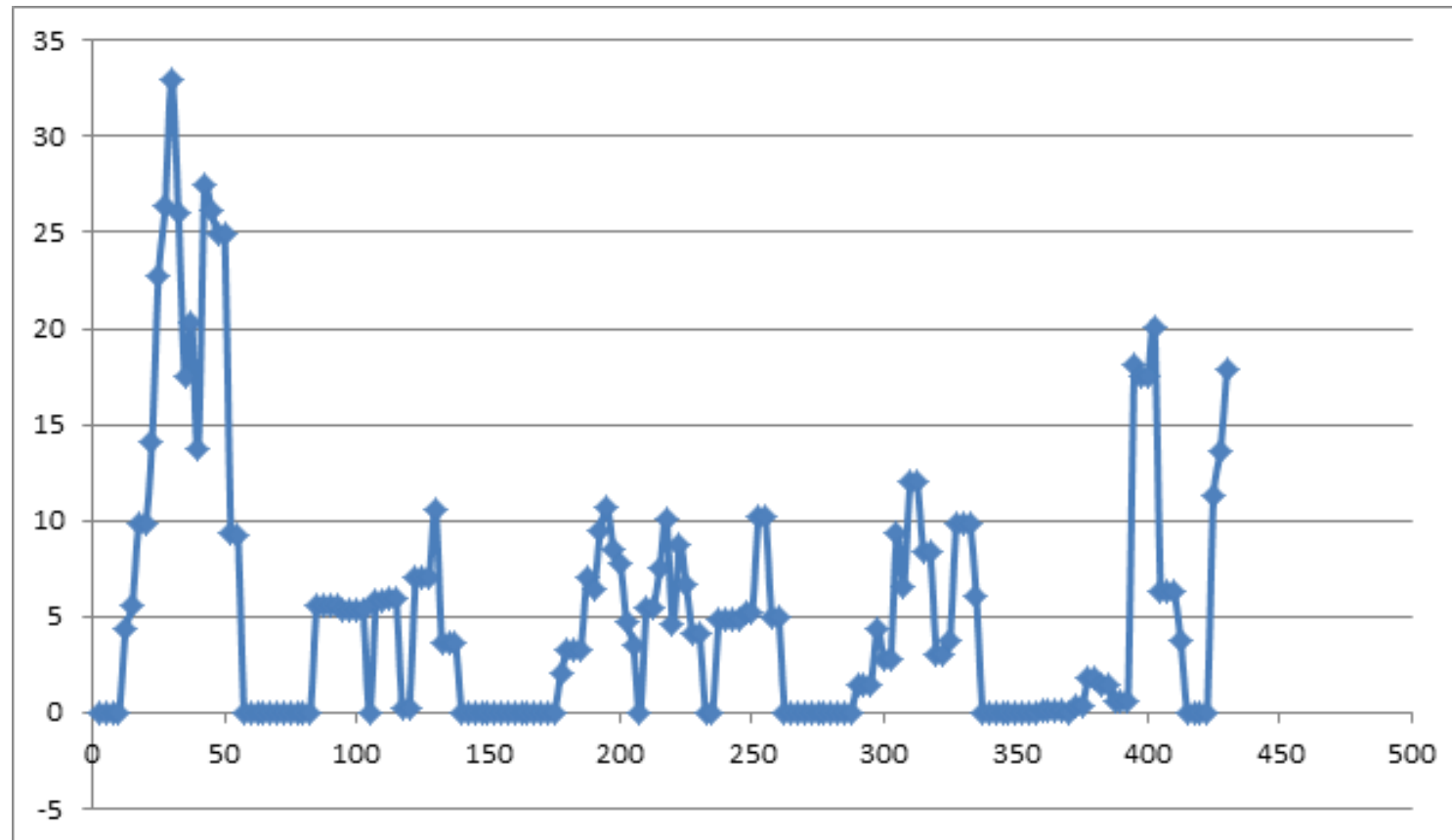
# Emotional Conversation
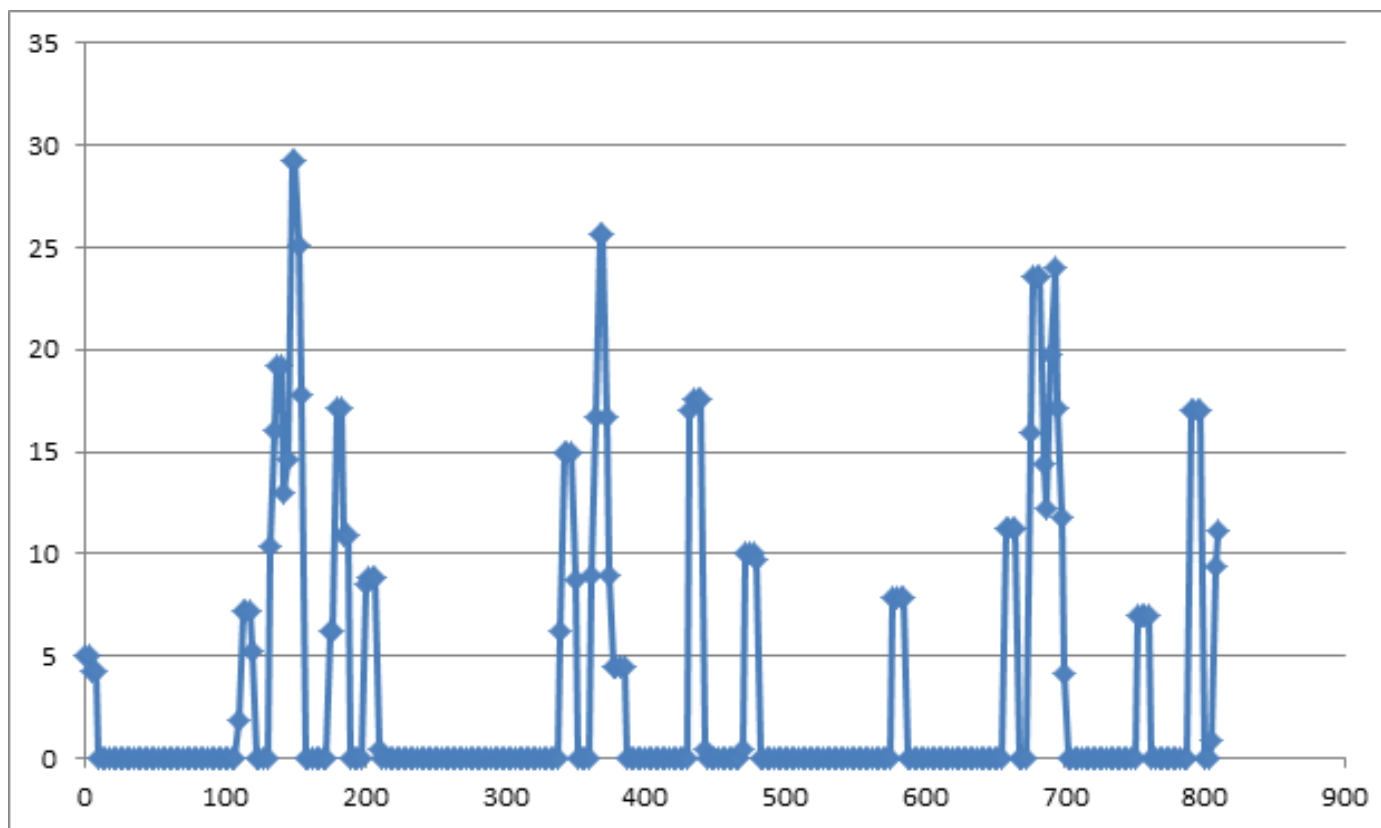
# What Do Businesses Want?

Reduce Claims Cycle
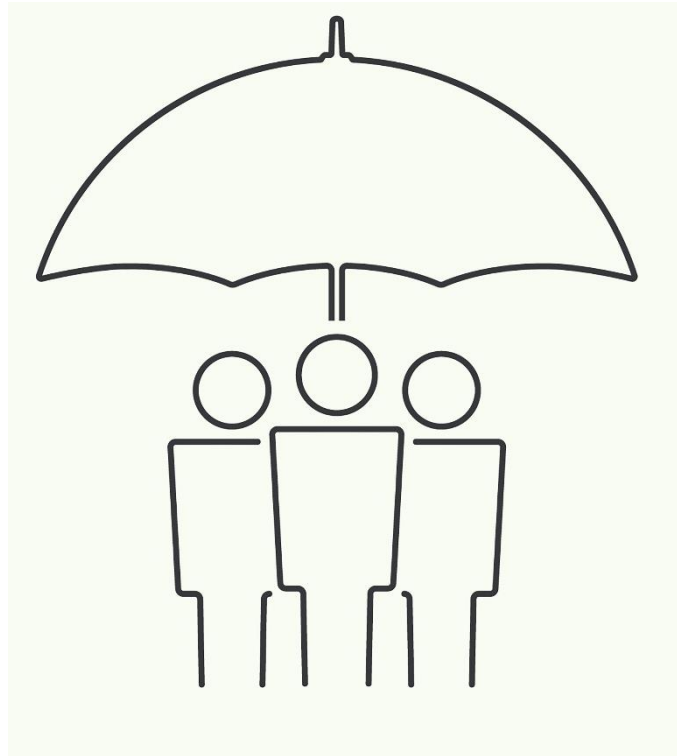
Protect Genuine Customers

Identify Fraudulent Behaviour

# How Can We Help?

- Access every spoken word
- Proactive Staff Monitoring
- Know your customer
- Compliance Assurance
- Business process adherence
- Customer Experience Monitoring
- Trend Analysis
- Human Resources
- Contact Centre
- Predictive Analytics
- Complaints Intervention
- Visibility

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# Probing

**1**

S: Um (2 seconds delay) I didn't really notice him until, well I seen him in Wetherspoon's and I'd seen him in there and then he was in the Eclipse as well um a very strange man, tattoo's all over his face, I'm not being judgemental but you know, you do notice things like that

Pause
Negation
Broken Sentence
Repetition
Temporal Lacunae
Pause
Disparaging
Negation
But – to minimise what preceded it
"You know" not taking ownership. Wrong pronoun. This is proven as she has not mentioned it earlier and therefore may not be speaking from memory.

**2**

## Probing

Wetherspoon's          and then
                       The Eclipse

"…. well I seen           He was in…
him in"

| When did you 1st Notice?  H  "Erm…I didn't really notice him until…." | dp | H  …A very strange man, tattoos all over his face | "I'm not being judgemental…but you do notice things like that" | C  tfe |
|---|---|---|---|---|

**3**

JUMPTO TOPICS

Cornwall Police
Going Missing
Miles An Hour
Wetherspoons
Star Vehicle
Knife Point
Man Running
Carrington
Phone Call
Soda Straw
Kevin Care
Part Time
Back Care
Meantime
Ordinary
Describe
Cornwall   2
Complete   2   3

wav ;
h8JSBmHzG
2016-05-11 0

0:53

SPEAKER 1:
And It's Take
Writing Ever
Describe In
Remember S
Place Yes Pa

SPEAKER 2:
Loss Or O.k.

UNKNOWN
Faith

SPEAKER 4:
At Home An
He Was Take
Obviously A
One Their N
Could Do Th
And That W
Immediately

SPEAKER 2:

# Credibility Network

Voice Activity Detection

GPU-accelerated RNN-based Speech to Text
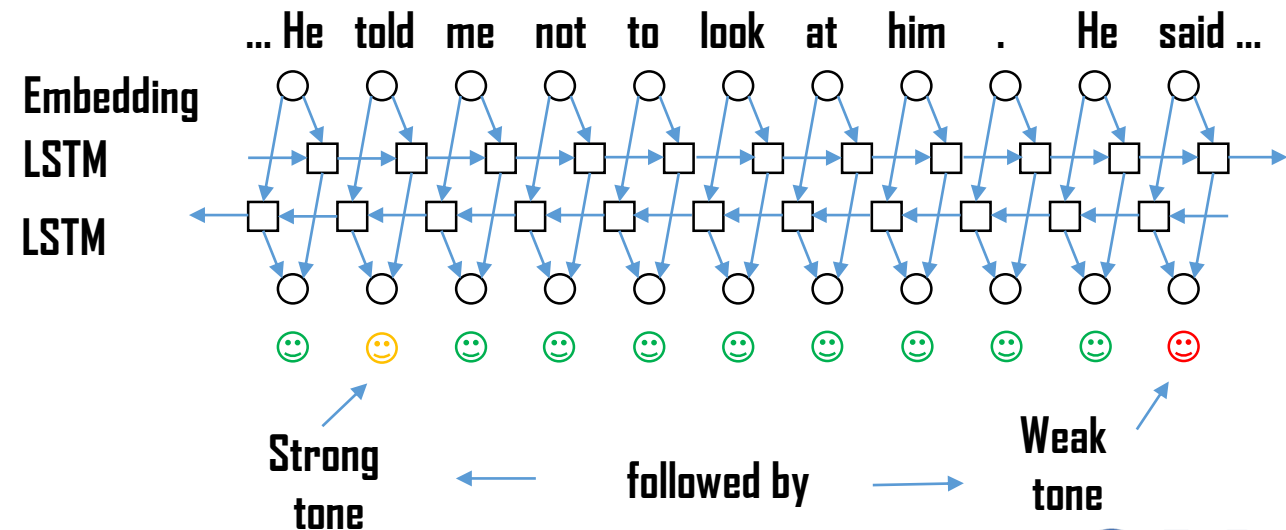
i-vector diarization

**INTERVIEWER**

What happened next?

**CALLER**

He told me not to look at him. He said he would shoot me if...

... He told me not to look at him . He said ...

Embedding

LSTM

LSTM

Strong tone

followed by

Weak tone

- Inspired by recurrent networks for named entity recognition and part of speech tagging
- We can use bi-directional recurrent networks to attach credibility tags to the speech transcription
- Bi-directionality is important for context
- Network can tag explainers, changes in tone, pronouns etc.

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# Claims Validation



- **Non-committal**
- **Sensitive**
- **Evasive**
- **Parroting**
- **Negation**
- **JumpTo topic**

# Conclusion

## Questions

?

## Thank you