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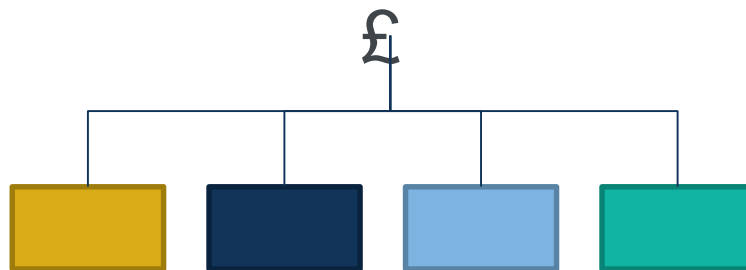
# Machine Learning: Now and in the Future

Andy Rigby & Renaud Million



# Introduction

- Machine learning has now become “mainstream”
- But current applications limited:
  - Pricing (risk and retail/behavioural)
  - Reserving
- Looking at other industries and emerging trends, applications could be much wider
- A whistle-stop tour through other applications to show both potential benefits and risks/challenges:
  - Core competencies
  - Non-core competencies





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# Core competencies

# Modelling/current applications

- Rapid increase in number and complexity of models
- More time spent following processes than exploring and adding value
- Rise of automated/partially automated model development solutions
- Consider “insurance-specific” machine learning methods

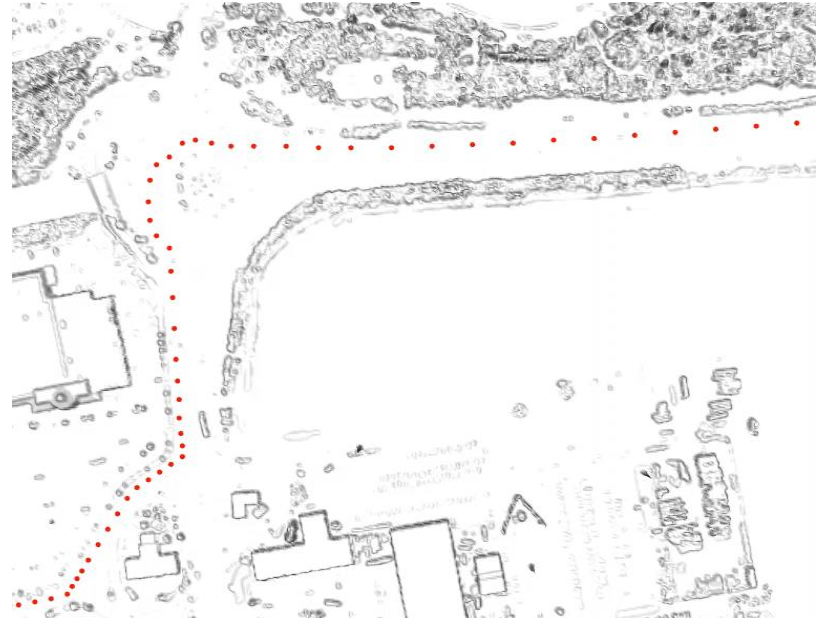


# Deeper understanding of risk

- New types of data
  - Often larger/messier than actuaries typically work with
  - Clear opportunities for better risk understanding if incorporated correctly
- Can be time consuming to explore all available data sources

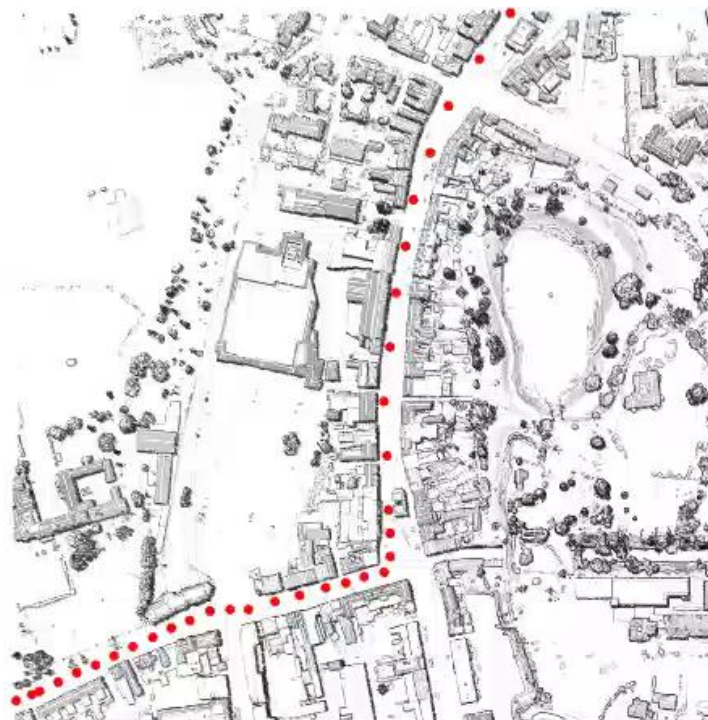
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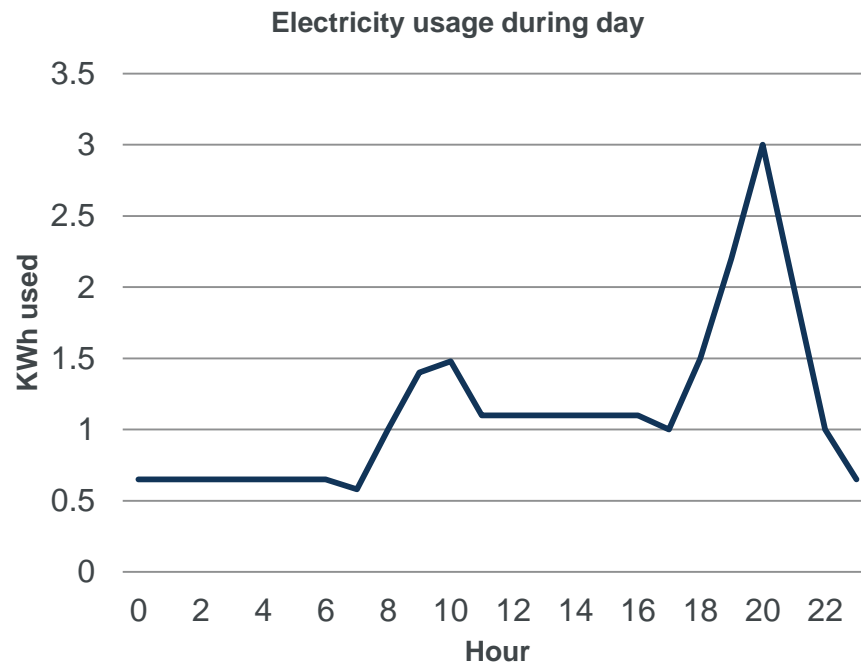


The driver proceeded down a street with a multitude of cars parked on the right. They passed a narrow area of road, blocked by a van with oncoming traffic and stopped at a set of traffic lights



# Internet of things/smart homes

- Installation of smart homes/smart meters
- Energy signature can be resolved into appliances used:
  - Indicators of risk (e.g. home insurance)
  - Monitoring of usage (e.g. response to health incidents)



# Drone technology

- Move towards no/fewer questions asked:
  - Roof surface/building construction
  - Surface area
  - Surrounding area
- Suspect may be supplemented by LiDAR/aerial photography in most areas



# Drone technology

- Current drone technology already presents considerable risk (BI and other)
- Full drone automation?





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# Non-core competencies

# Customer journey – website

- Standard website for all customers
- Typically fairly generic/safe branding – appeals to majority of expected customers
- Most common customer journeys are well planned
- Customers with more unique needs may be underserved/feel alienated

# Customer journey – website

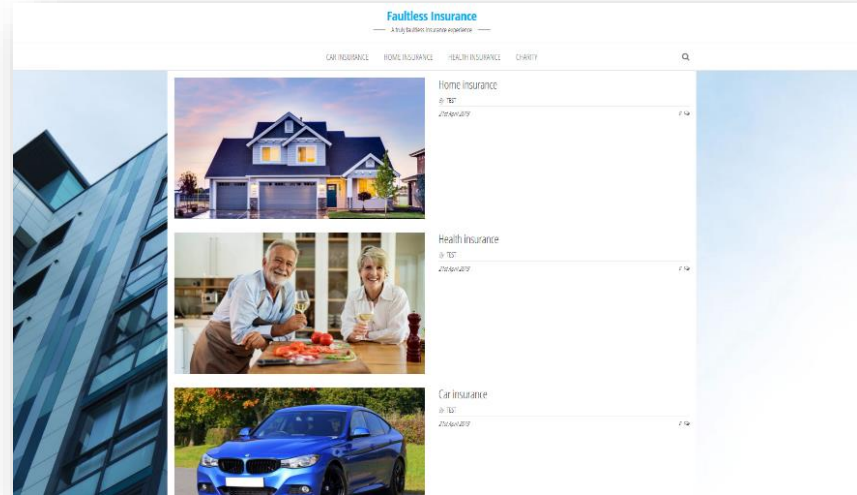
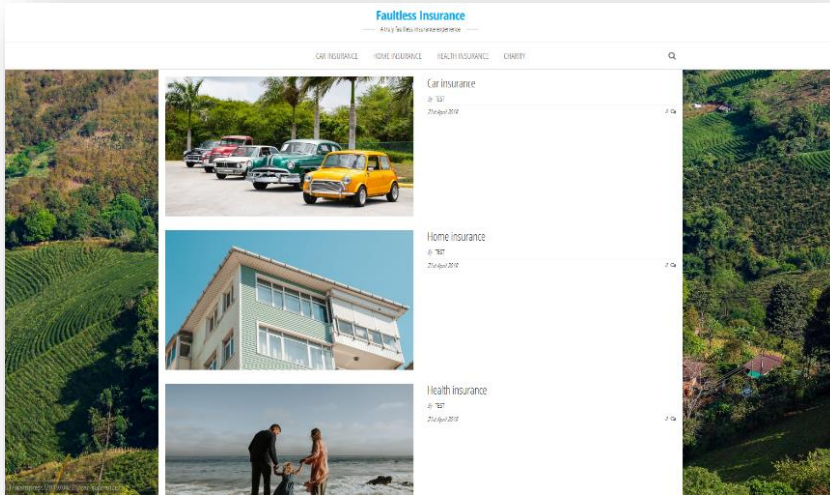
## Customer 1

- Aged 30-40
- Recent quotes for car insurance across multiple vehicles
- Lives in flat
- Potential interest in charitable giving / socially conscious suppliers

## Customer 2

- Aged 50-60
- More affluent
- Car insurance already held
- Recent quotes for home insurance – 4 bed detached house

# Customer journey – website



- Same core message and branding, but customised to client needs

# Customer journey – website

- Customised website for each customer:
  - NOT fully customised – core branding/message retained
  - Customer needs modelled and relevant products given greater prominence
  - Relevant positive aspects of company emphasised
  - Imagery aligned with customer profile (GAN?)

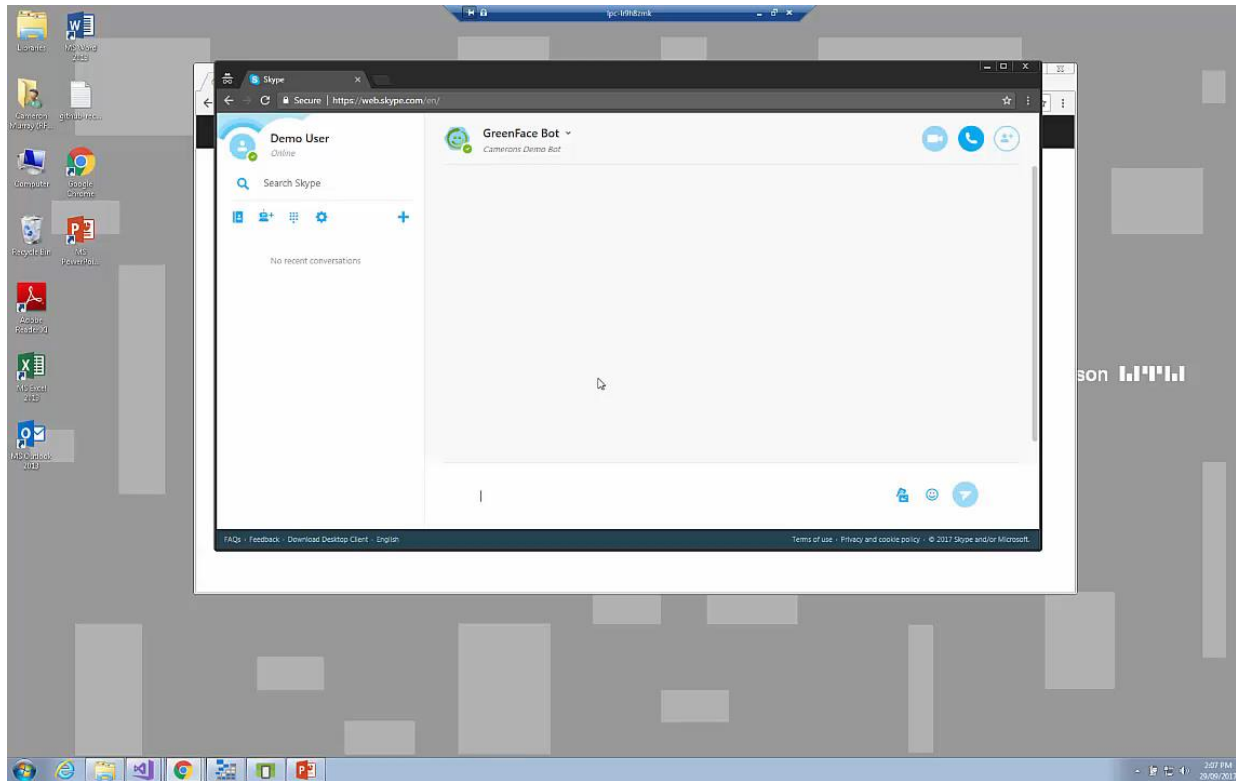


# Customer journey – telephone

- Standard script across all agents:
  - May be compliant, but is it the best way to meet customer needs?
- Custom scripts by conversation:
  - Provides all options to customer, but prioritised by most likely needs
  - Recommendation engines
  - Could be implemented with live pricing system
  - Could also highlight particular benefits/exclusions that are most likely to impact customer purchase decision
- More informed customers and greater trust in industry

The image shows a screenshot of a web browser displaying a 'Quote Form'. The form has a white background and a black border. At the top, the title 'Quote Form' is displayed in a dark font. Below the title, there are three input fields: 'Driver Age', 'Vehicle Registration', and 'Postcode'. Each field is a simple white rectangle with a thin grey border. Below the 'Postcode' field is a green rectangular button with the word 'Submit' written in white. At the bottom of the screenshot, the Windows taskbar is visible, showing various application icons and the system tray.

# Customer journey - chatbot

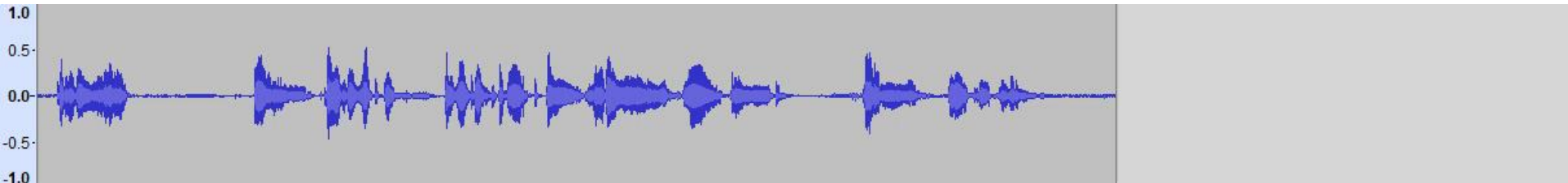


# Customer journey – chatbot

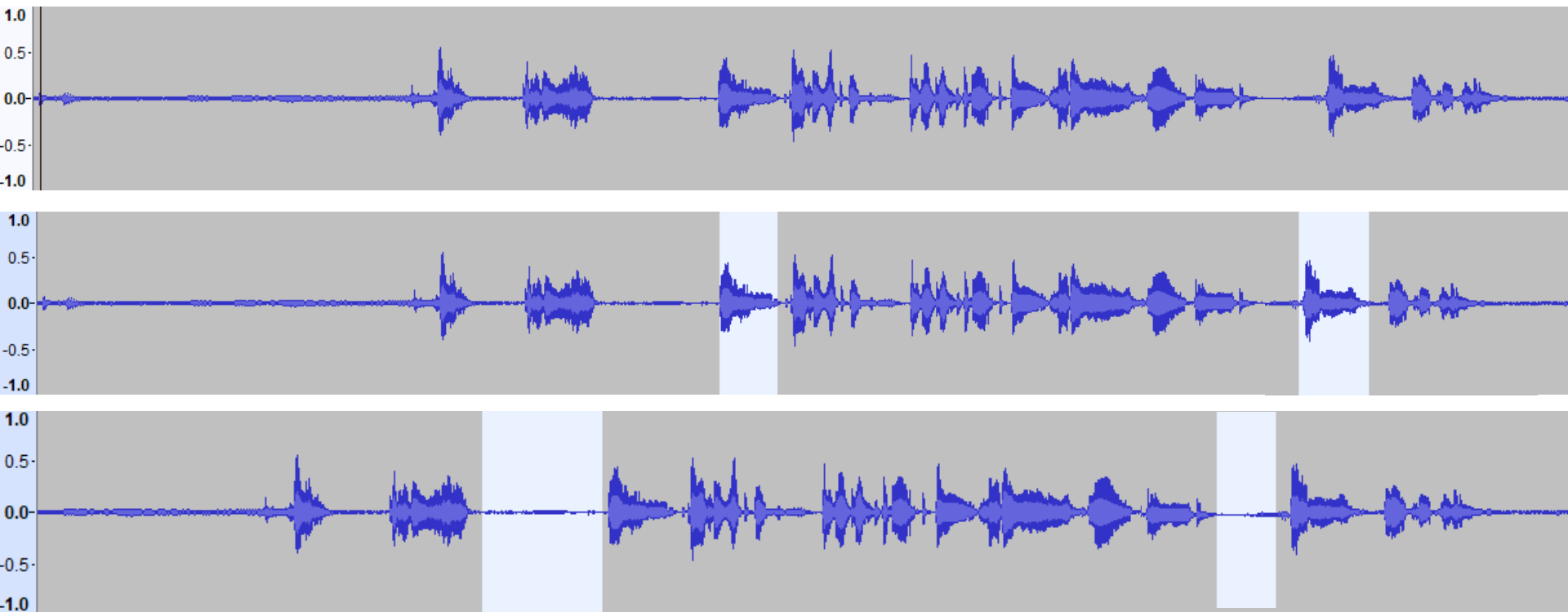
- If implemented well, offers a multitude of advantages:
  - Available whenever the customer needs
  - Always compliant, always best practice
  - Lower cost
- Deep dive into this area during second half of talk

# Telephony

- Substantial number of customers still want/need telephony services from insurer:
  - MTA
  - Confidence prior to purchase
- Significant proportion of customer confidence depends on quality/tone of delivery:
  - Location of contact centres
  - Training of agents



# Telephony – remove pauses

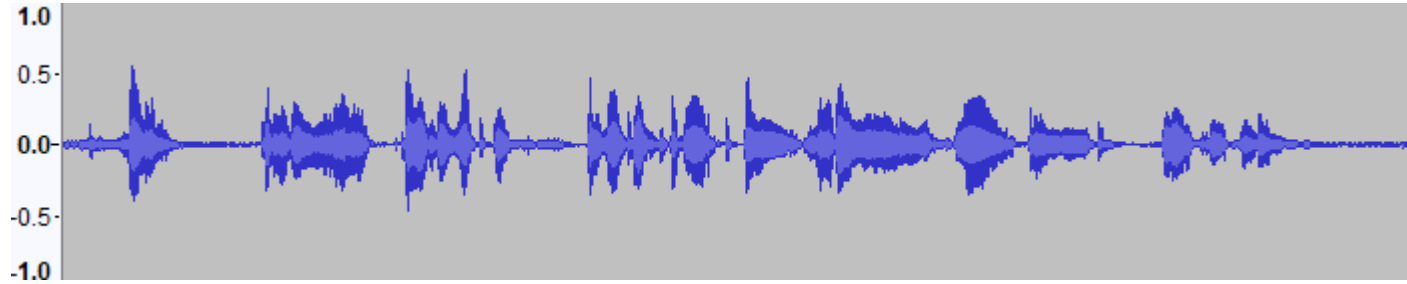


# Telephony

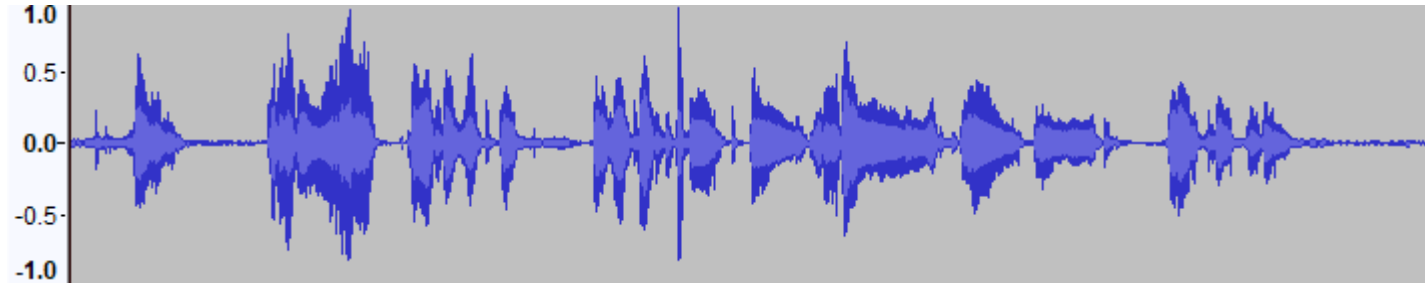
After pause removal



# Telephony – improve voice quality



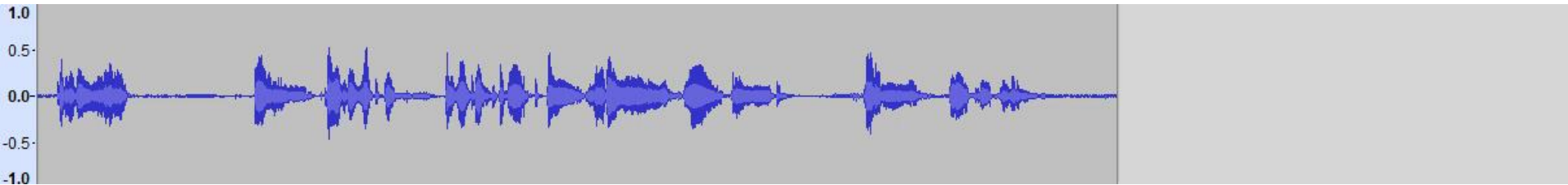
# Telephony – improve voice quality



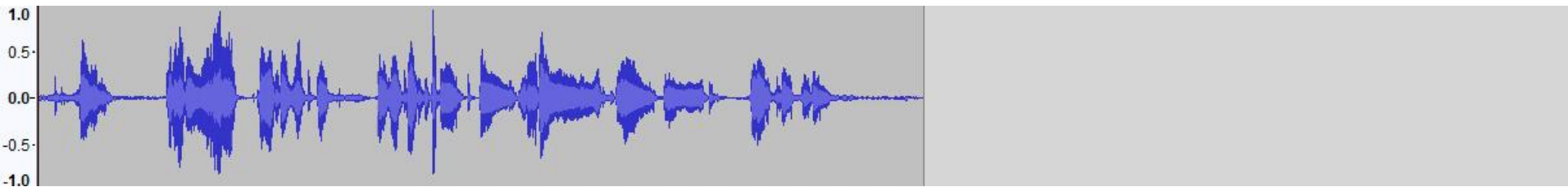


# Telephony – results

Original

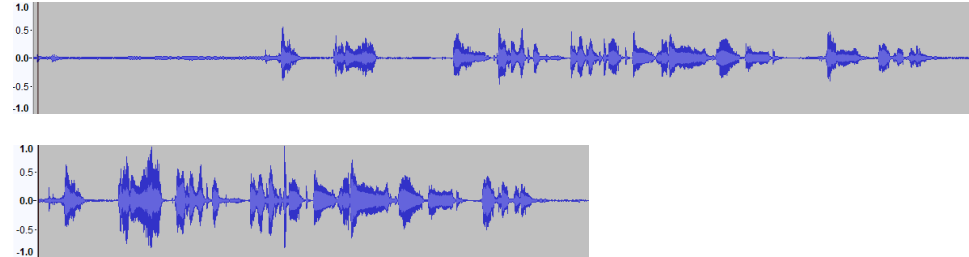


Processed



# Telephony

- Machine learning approaches enable the automatic processing of live voice:
  - More confident sounding calls
  - Higher customer satisfaction
- Pattern recognition could be used to automatically score calls for compliance (see “custom script” demonstration earlier)



# Conclusion/Extensions

- Despite the fairly restricted use cases where we currently employ machine learning, other industries and technology trends point to many other applications
- Clear ethical/moral questions about some applications and a mixture of risks and opportunities
- Actuaries likely to be at the forefront of using these methods so should start preparing!
- Fairly brief overview of many areas – happy to chat later if any questions
- Now let's deep dive into one of these areas in more detail – over to Renaud!