2. A range of visualisation and mapping techniques used in all phases of research

6. An illustration and its accompanying spectograph show a chatbot's death threat taken from an early Rudiment. The excerpt shows the curve of particular words on the strips of talk including the ending and beginning of a word. These illustrations were inspired by the visual analysis of Charles Goodwin (Goodwin, 2000: 1495-1497). The spectograph was created using the opensource software, Audacity. The second illustration shows the same utterance from the same chatbot made several years later showing the pitch, speed and volume of the chatbot death threat when performed as an audio recording.
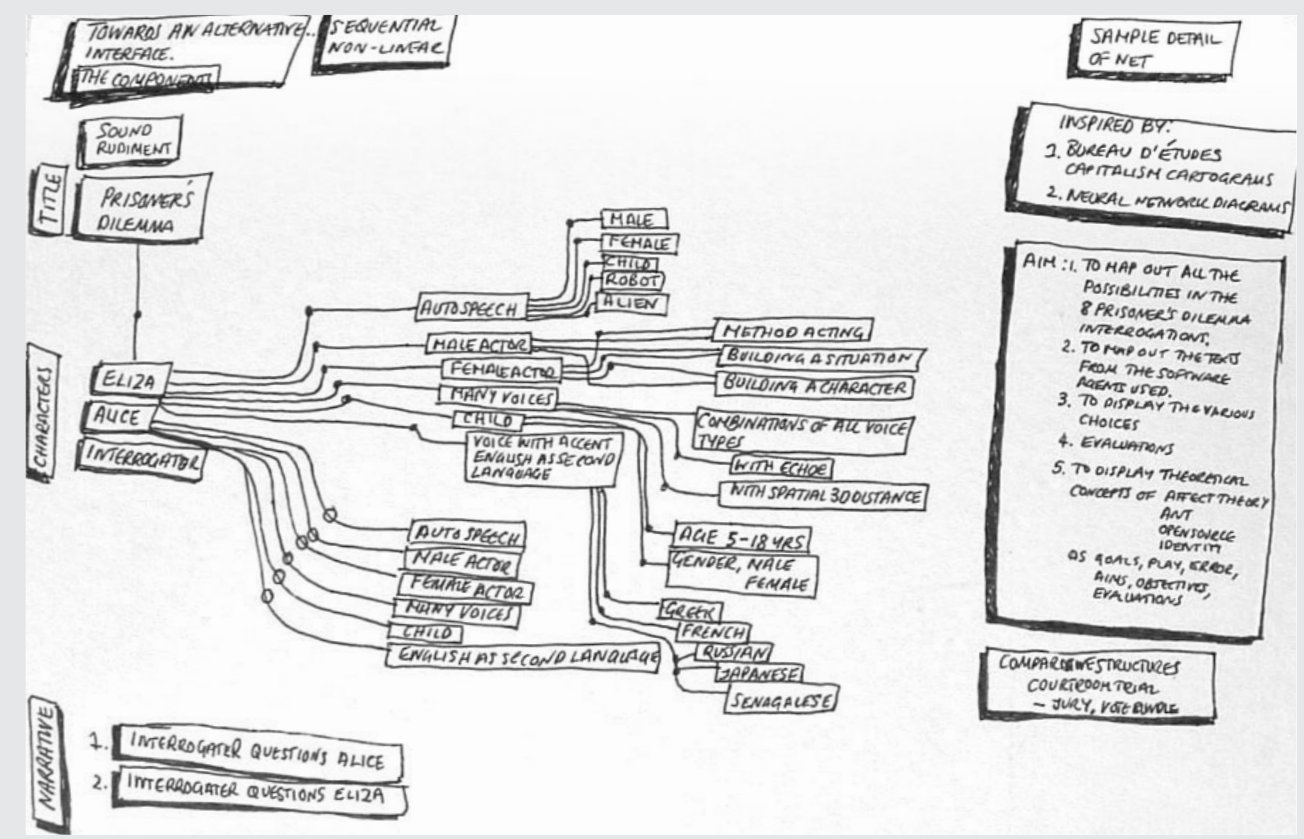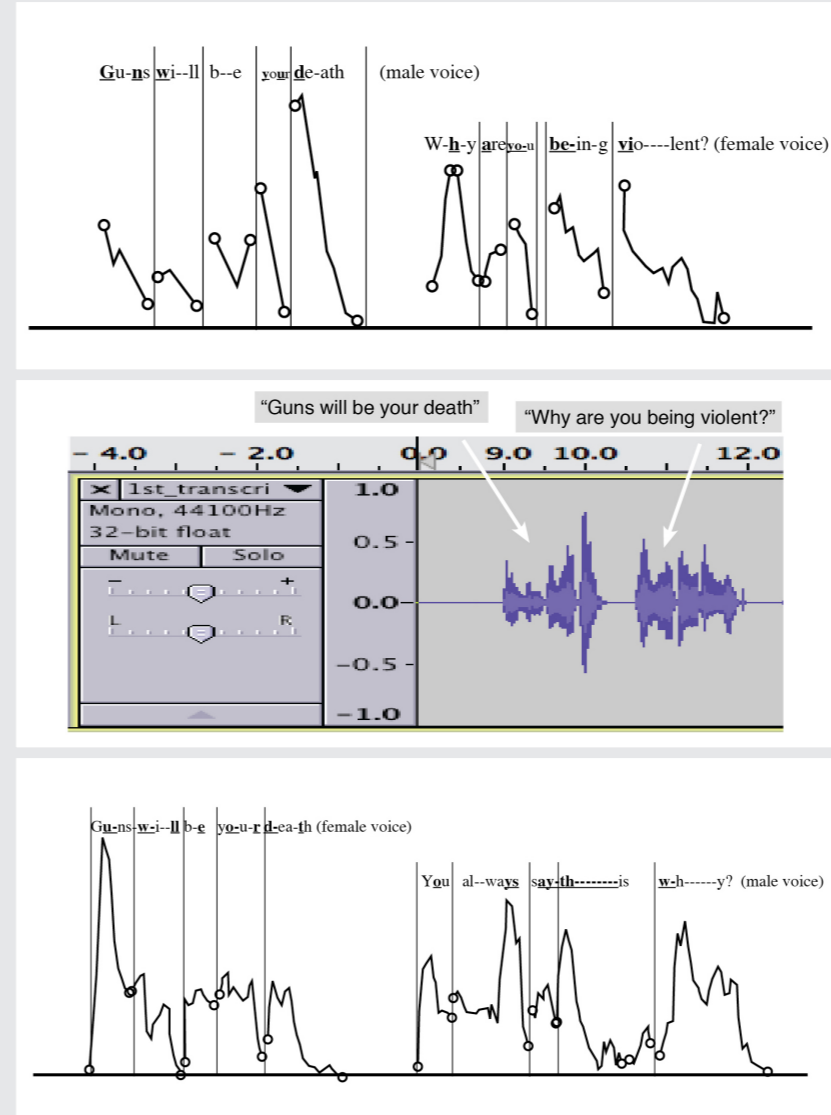
4. This diagram was a part of a series of visualisations that were considered a good representation of the complexity of AI even though they depict performance techniques.
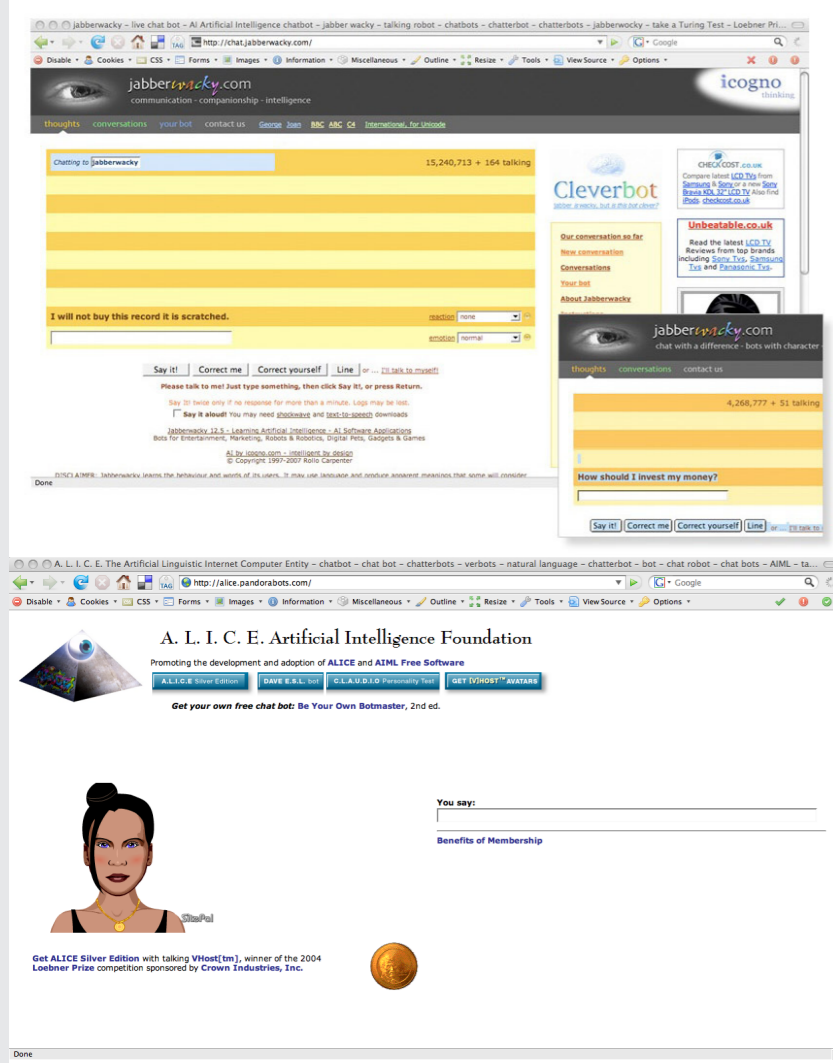
0. Top: Jabberwacky's interface was updated part way through the study to contain the drop-down emotional lexicon list which is indented above. Image Source: www.chat. jabberwacky.com [Accessed 31st October, 2008; and for the lexicon list, 1st June 2010].

Bottom: Chatbots can have digital avatars that are animated such as Alice. Image Source: www.alice.pandorabots.com [Accessed 31st October, 2008].
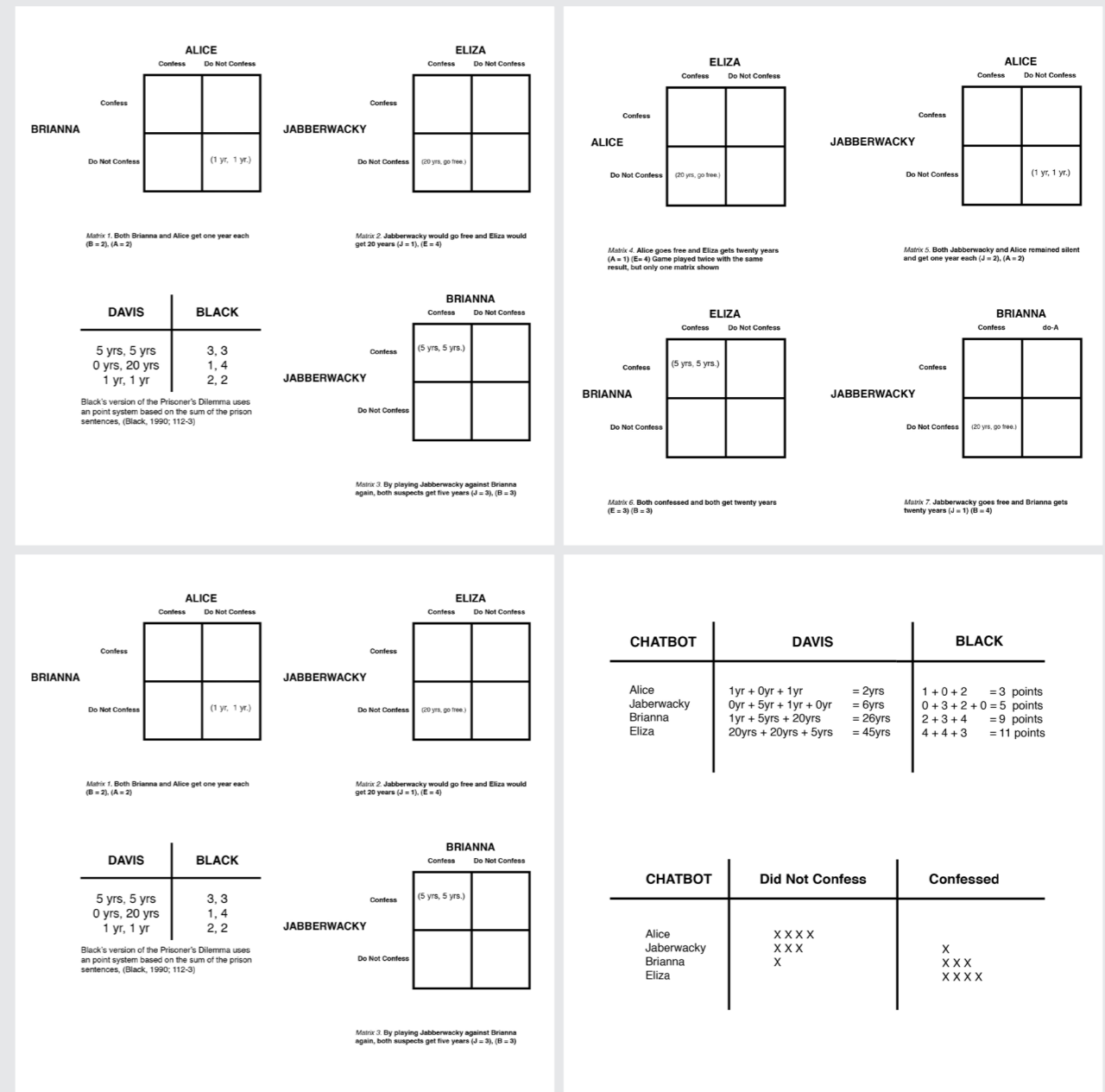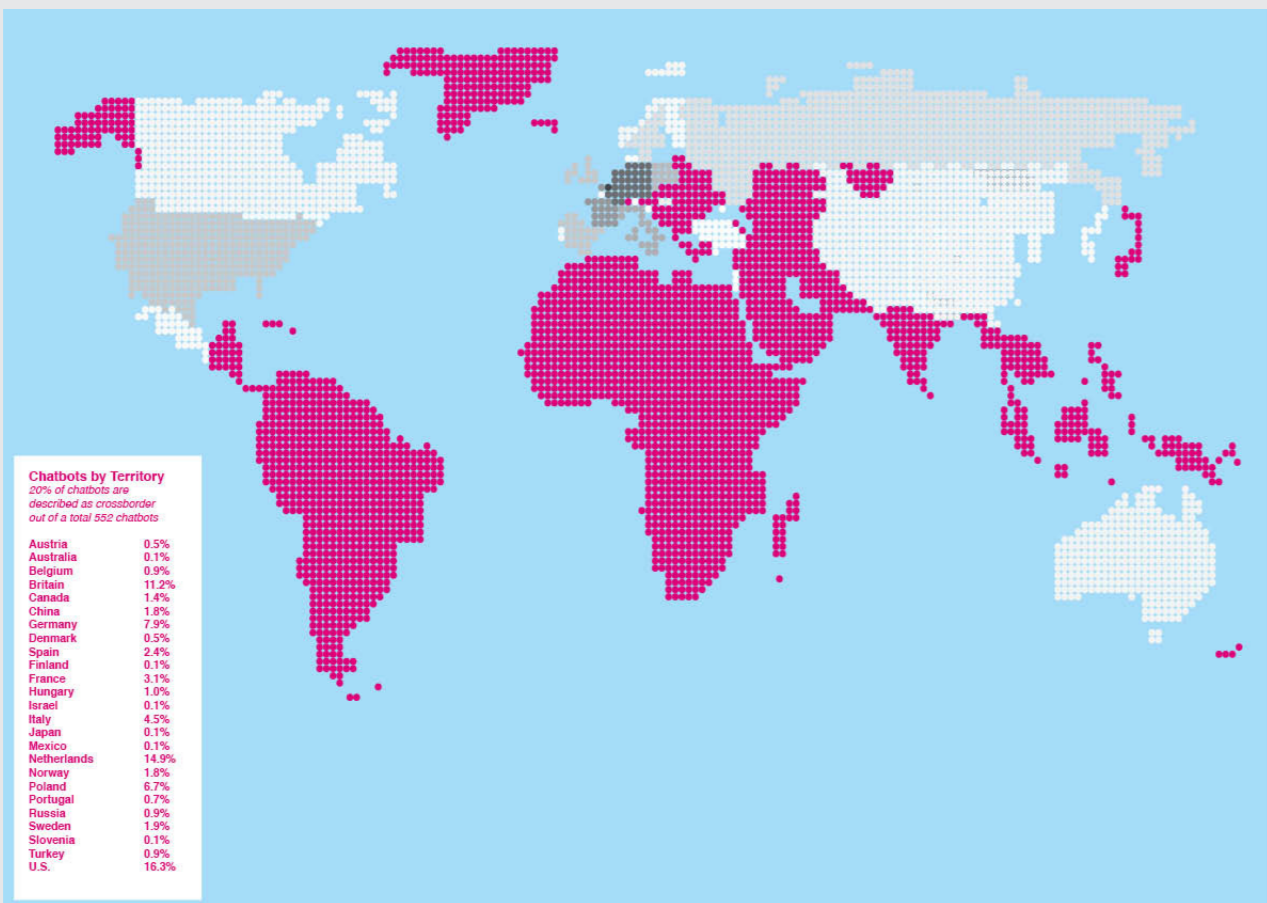
The Pick-Up Rudiment
With Eliza (30th December 2004)

The Pick-Up You["]:                     Fuck you.
The Pick-Up Eliza:                     Oh, I ||.

Human:     I never said that?
Eliza:       Can you elaborate on that?
Human:     Fuck you
Eliza:       Oh, I ||.
Human:     did you write that?
Eliza:       Oh, I write that.

["You: is the name given to an entry made by the user of a chatbot such as myself and for ease of reading it has been replaced throughout with "Human." except for the Pick-Up above.]

9. The first two lines of the script above are a 'pick-up' technique used by a chatbot developer to get interaction started. They were designed as a part of the research process as provocative, or as explicit as those I encountered with this Elizabot. The pick-up shapes the content at the start of interaction and creates the order of turn-taking. It is also a subversion of conventional meet and greet rituals. Not all chatbots use this technique.

5. Co-word occurrence in size, the black arc represents a part of the circle if scaled to the two smaller circles indicating the co-word occurrence of the human interlocutor and the chatbot, depicted in size respectively.

7. The matrices are based on the matrix model of Morton Davis. Image Source: Davis, 1970: 94. The original matrix shows the two sentences for each prisoner as a consequence of each other's action. The decision to confess or not is unknown to each of the prisoners in this configuration. They show the Prisoner's Dilemma played by two chatbots but the full data set contains the Prisoner's Dilemma as conducted with four chatbots, Alice, Jabberwacky, Brianna and Eliza. The table below shows each chatbot's prison sentence and their corresponding points using Black's assignment of points to each sentence. The table below shows how many times a chatbot confessed or did not confess. The results show that the chatbots overall, confessed as much as they did not confess.

1. A map showing the location of chatbot territories designated by their developers.

# Inscribing Complexity: Diagrammatic Interventions

## The Familiar Stranger

In the 1950s Artificial Intelligence expert systems emerged. Sixty years on expert systems operate online within social networking interfaces and are applied to all forms of automated service. Software technologies such as spiders, webcrawlers and chatbots are the familiar strangers of the late 20th and 21st centuries. Their repetitive talk, instructions and commands echo in actual and virtual networks and are the notable, ordinary enactments of an automated familiar stranger. Chatbots are semantic (that is text-based) AI, which has moved out of the AI laboratory. Chatbot development is now predominantly situated online. Chatbots are an area of research that has moved from the concerns of psychology in AI (Weizenbaum, 1976), to the concerns of interface and interaction, as marketing tools of the internet (Wallace, 2005). I observed how chatbots operate partially and in between; how they manage relations in close proximity; why their developers insist on particular kinds of talk and listening; and how intimacy is denied as a consequence of the methodological imperatives.

The following 9 points outline aspects of a design-led "method assemblage" (Latour, 2004: 161), emphasizing the various visualization techniques used, showing the blur between visual (and audio) techniques of representation and intervention in a study of enacting territorial violence and design in human-computer interaction.

## Enacting Territory

Software agents (of which chatbots are one kind of software agent) are more generally to be found in the most intimate spaces of the ordinary and the extraordinary. They are situated in public spaces, such as trains and internet chatrooms — operating nowhere special, with the ability to be nowhere special. They are to be found in hospitals, ATM machines, in telecommunication systems, photocopiers, the cockpit of jets, in virtual bordellos or in remote controlled devices operating at the remote spaces of the universe. They can help operate on the roughest terrain be that in mars or within a nuclear reactor or a disaster area. They can transcend borders and boundaries, or territory (virtual and actual) and territoriality (human and machine), but what local and universal contexts do chatbots enact? Chatbots do not need to be defined by national borders and 20 percent of registered chatbots are described as "cross border." However, in Sweden and chatbots are used as custom officials by border agencies enacting geographic and bureaucratic borders.

## Visualising Speculative Rudiments

'Rudiments,' as the little preamble you mentioned explained, are studies that are left undeveloped. The material itself is not refined; it is in the process of refining itself. (Lyotard and Thébaud, 1979:15)

I borrowed and extended the principle of Rudiments from Lyotard's and Thébaud's book 'Just Gaming' (1979) to intervene with conventional experimental methods. The Rudiments aimed to game or to introduce key topics in order to see how the chatbot created responses, how they elided, censored or learned to reply.

Experiments are uncovered and understood by the rudimentary process defined by and through the work with chatbots. Rudiments are iterative processes, a form of speculative research design used to probe the ways software agents interact. The images depicted show the interrelation between a rudimentary method by practice and the interventions that can be made into existing methods of experimentation. Rudiments are not a substitute for another method they can be used in conjunction with other methods creating a method assemblage. Maps were designed to understand the interrelation of speculative design processes such as — Rudiments are not a substitute for another method and they can be used in conjunction with other methods such as — affinity diagrams, bricolage, co-word occurrence tests and Leximapes (Cambrosio et al., 2004), to existing mapping techniques in AI but also used within the social sciences (Latour and Teil, 1995).

## Robitron

These stages of mapping were overlapped with a move to performative methods taken from the practices of fine art and theatre when the study became concerned with the organizational aspects of a chatbot system. The main data was collected from live conversations with chatbots which led to generating performative, audio text-based Rudiments (see section 7). Alongside 5 years of archives of chatbot conversations, the main chatbot forum's archive was used, with over 9,000 members of Robitron posting regularly. This was useful to help understand the technical aspects of the chatbots and to further access evidence unavailable in the Rudiments, subsequently needed to interpret and question the Rudimentary findings. The archive was used after most of the Rudiments were created. This was an attempt to segment the speculative phase from the analysis of the data-collection. Visualisations at this stage were used to understand the underpinning theoretical frame. The archival research was secondary only in its chronological respect to the work done in the Rudiments. In analysis it was used to compliment the Rudiments and from this stage on was treated symmetrically.

## Neural Networks, Affinity Diagrams

An AI Laboratory in Italy subsequently commissioned several of the maps that were designed as a part of the research process as examples of AI complexity. The diagrams appeared to be (and enacted) the visualisation techniques of AI network diagrams. On the one hand this mapping was a way of stabilising the complexity in the research. However, the mappings of chatbot research were sometimes making certain themes superficially simple, whilst at other times the visualisations were making research overly complex. Often it was a bit of both. Several of the computational techniques began to blur the distinction between representation and intervention, particularly the network diagrams and affinity diagrams.

## Co-Word Occurrence Testing

Co-word occurrence software can trace words but legally not the interlocutors of those words. Developers are gatekeepers of both meaning and the appropriate use of offensive language. With the help of a Robitron developer, Tom Joyce he ran a co-word occurrence search on his E Alicebot, a chatbot interacting with the public since, 2008. A co-word occurrence test was used to trace the quantity of offensive language made by interlocutors and chatbots. This method cannot trace the ways offensive language can be switched on or off. Legally, in the EU chatbots also cannot track content back to the chatbot user/interlocutor. In some chatbots expletives are deemed offensive and chatbot's ability to learn from interlocutors is switched off. Using opensource software on the chatbot's database I gathered quantitative data which was supplemental to the quantitative (narrative/conversational methods). On a database of 26,765 logs, there were only 309 occurrences came from the Alicebot, only 0.2% of all inputs. By manipulating what a chatbot learns to repeat, a caution-network is created between users' and a chatbot (and developer), that is to say a network of prohibitions to protect and channel conversational topics.

## Spectographs & Audio Rudiments

Audio Rudiments are the performances of the chatbot conversations using voice over specialists to perform the transcripts as a reflexive process. The audio rudiments give voice to a chatbot as they are characteristically mute. The reason for doing this is to give voice to how their talk is heard. This could be criticized as attending to the dramatic aspects of chatbot talk, I would argue however, that ordinary actions can encompass fictional registers of drama which have a spike effect, a form of noise that perhaps ought to be listened to in order to understand the performance of defensive utterances. The performances are an enactment of the affective atmosphere in the voice that is absent but heard by the user/interlocutor. Voice-over specialists were not asked to perform gendered roles, but chose to interpret the transcripts in the ways indicated. Although this is an analysis of an imaginary performance, how one hears violence in text will make a difference to the way violence is interpreted. Hearing the words in one's head is to imagine a voice and to interpret this voice in many ways so that the text becomes embodied within thought. In doing so the inner voice decentres one body, a phantom body, in the imagination of the other.

## Gaming the Prisoner's Dilemma

Philip Auslander in his research on performance, remarks that chatbots are not 'playback devices' yet I would suggest that they are a mixture of playback and live interaction (2008: 81). The looping of interactions that occurs in the chatbot transcripts is useful in that it plays with reflexive methods. Chatbot interaction is predominantly a bias of one-sided interaction, an interrogative language constantly undermined by disconnects.

The non-iterative prisoner's dilemma (Tucker, 1950) was reenacted with chatbots, the dilemma is based on a gaming theory that enacts a non-violent interrogation that is reliant on threat and forced decision making. Entrapment is a coercive mode of interaction, a reciprocity based on mutual cooperation. I used the gaming strategy to question the notion that chatbot talk is inherently interrogative. The dilemma isn't just about imagining prisoners but about getting caught up in conversational logic traps. When the dilemma is conducted a mathematical conundrum it seems to take shape as a 'matter of fact' yet when observing the dilemma as a parable of entrapment it becomes a 'matter of concern' (Latour, 2007: 261). It is a paradox of cooperation.

## The Pick-Up Technique

A potential conversational expert lurks within the developer's pick-up sequence evident in the use of the [ ] brackets. I would suggest that the main user-group of chatbots are conversational experts, since this group has reasons to interact with a chatbot. The [ ] are a type of interjection used in a variety of ways, such as proofreading, coding C++ to place metadata, or as gestural indications, or pauses (ellipses) used by a director to make notes to actors. Each method nests information within information. Researchers are exposed to each other's techniques. When a researcher encounters another's research within their experimental procedure, the insideness of the experimental/ rudimentary procedure is extended. The depth by which one experiences the inside and outside of a researcher's space also spreads outwards in both diagrammatic and written critique. This opening out of the chatbot technology helped to rethink territoriality with other automated systems.

## Connectivity

Chatbots are strange honeypots of creativity. To converse with a chatbot is to participate in a hive of activity that promises to produce interaction as good as honey, yet what ensues is an artificial substitute. A simultaneous understanding of a chatbots' connectivity and its meaning which, is derived from nonsense or congruent content is key. In an analysis of such connectivity it is important not to get hung up on the visualization languages but to understand the separating-out of the diagrammatic from the conversational, particularly when using intervention as a method of enactment. It is important to understand the interweaving of representational digital visualisation as enactments of the research process, in the phases of speculation, intervention, performance and summation.