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Shah, H. and Warwick, K.

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Machine Humour:
Examples from Turing Test Experiments

Huma Shah and Kevin Warwick

Coventry University, Priory Street, Coventry, CV1 5FB, UK

Email: h.shah@coventry.ac.uk, k.warwick@coventry.ac.uk

Corresponding author: Kevin Warwick, tele: 44-247765-9893

Abstract: **In this paper we look at the possibility of a machine having a sense of humour. In particular we focus on actual machine utterances in Turing test discourses. In doing so we do not consider the Turing test in depth and what this might mean for humanity, rather we merely look at cases in conversations when the output from a machine can be considered to be humorous. We link such outpourings with Turing's 'arguments from various disabilities' used against the concept of a machine being able to think, taken from his seminal work of 1950. Finally we consider the role that humour might play in adding to the deception, integral to the Turing test, that a machine in practice appears to be a human**.

Keywords: Deception Detection, Natural Language, Turing's Imitation Game, Chatbots, Machine Humour

INTRODUCTION

In his 1950 paper (Turing, 1950) Alan Turing raised the issue that whatever abilities machines/computers might exhibit, there would be humans who would subsequently comment that no matter how good these abilities were a computer could never (for example) "have a sense of humour". Such a result then leads to

consequential conclusions that therefore machines could never have ”genuine intelligence” and as a result “computers would always remain subservient to us [humans], no matter how far they advance” (Penrose, 1994). Despite Turing’s foresight it is apparent that some clearly believe in the inferiority of machines, particularly where humour is concerned. Consider for example the following which appears to fit exactly into Turing’s description: “computers, whatever artificial intelligence they may display, cannot make good jokes” (Rickman, 1999).

What we wish to question in this paper is the ability of machines, or lack of it, to, as Rickman puts it, make good jokes and, in doing so, exhibit, as far as we can tell, in a Turing sense at least, a sense of humour. We provide here, as evidence, actual transcripts from Turing test experiments (Shah and Warwick, 2010) which include examples, we feel, that indicate humorous outputs. We subsequently reveal whether or not any humour exhibited by a machine had a positive effect as far as the Turing test is concerned. We also investigate the curious concept that a human exhibiting certain types of humour, or showing a lack of it, can, as a direct consequence, be considered to be a machine by another human.

In fact a body of research exists as far as machine humour is concerned (e.g. Binstead, 1996; Boden, 1998; Ritchie et. al., 2007; Smith, 1991). Largely this is founded on the machine creation of puns and riddles, based on the assumption that the creation of such humour requires much less in the way of background information than does understanding the humour, or to be precise “pun generation requires much less world knowledge than pun comprehension”

(Binstead, 1996). It has also been shown that puns generated by machines can be modified to suite the emotional state of receptive humans (Dybala et. al., 2009; Dybala et. al., 2010), where it was concluded that humour does have a positive influence on the dialogue between humans and machines.

In this paper we differ from those papers referenced in the previous paragraph in that we are not presenting particular AI algorithms but rather looking at the role of machines competing in Turing test experiments and, what might be regarded as, their humorous utterances in actual conversations with human interrogators. Specific methods and approaches taken in the design of such computer programmes were discussed in (Warwick and Shah, 2014a), and will not be covered further here.

We are aware that humour can be, to some extent, an individual thing and socio-culturally associated (Benton, 1988) and that some of the machine utterances presented here may not be deemed to be humorous in any way by some readers of this paper. We would ask such readers firstly to get a life and secondly to try to keep an open mind with regard to the observation that some readers might find some of the utterances humorous.

We will now consider Turing's exact comments with regard to humour from his seminal 1950 paper (Turing, 1950).

TURING'S ASSERTION

In his paper 'Computing Machinery and Intelligence' (Turing, 1950), Alan Turing wished to consider the question, "Can machines think?" Rather than get bogged down by definitions of both of the words "machine" and "think" he replaced the question with one based on a much more practical scenario, namely his imitation game, which has also become commonly known as the Turing test. We will shortly discuss the test/game in detail.

Turing went on to say "The original question, "Can machines think?" I believe to be too meaningless to deserve discussion. Nevertheless I believe that at the end of the century (that's the 20th century) the use of words and general educated opinion will have altered so much that one will be able to speak of machines thinking without expecting to be contradicted." He went on to say that unfortunately there would still be those (humans) who used non-scientific constructs to deny the existence of thinking machines. He subsequently discussed a number of arguments that would likely be used.

The fifth set of these denials were what he called "Arguments from Various Disabilities". In particular he said "These arguments take the form, "I grant you that you can make machines do all the things you have mentioned but you will never be able to make one to do X." Numerous features X are suggested in this connexion I offer a selection: Be kind, resourceful, beautiful, friendly, have initiative, have a sense of humour, tell right from wrong, make mistakes, fall in love, enjoy strawberries and cream, make someone fall in love with it, learn

from experience, use words properly, be the subject of its own thought, have as much diversity of behaviour as a man, do something really new."

Of course it would be expected, claimed Turing, that anyone making such an argument would provide no scientific back up at all for their statement. In fact we can add many more recent examples to Turing's list including such as to "smell a rose", which has been used by a variety of 'philosophers' of one kind or another (e.g. Penrose, 1994; Dennett, 1997). In 1950 Turing generously felt that such comments were really made because of an individual's experience with regard to machines at that time. Essentially from what machines they have witnessed, each being designed for a limited purpose, when they are required for a slightly different purpose they are, for some reason, considered to be incapable of doing anything other than their intended design. Often this is simply down to the individual's lack of understanding of basic scientific concepts, for example the ability of some machines to learn.

Turing pointed out that "A few years ago, when very little had been heard of digital computers, it was possible to elicit much incredulity concerning them". Although that was Turing talking in a time when there were not the computers around that we witness today, his point is still valid in terms of those who have a limited or no education in computer science and technology. Turing in fact considered such retorts to be largely unconscious acts on the part of those uttering them. He described them as being along the lines of "When a burnt child fears the fire and shows that he fears it by avoiding it".

Valid though all of Turing's points are here, what we wish to deal with specifically in this paper is merely one of the issues that Turing highlighted and that is the ability of a machine to have a sense of humour. We wish to show, through a series of examples taken from spontaneous conversations between a human interrogator and a machine (although at the time the interrogator did not know they were conversing with a machine) that machines can clearly exhibit a sense of humour.

WHAT IS HUMOUR/A JOKE?

Before we look at specific Turing test examples of humour, it is necessary to consider, to an extent at least, what exactly humour is and what having a sense of humour actually means. To start with, the Oxford English Dictionary (Stevenson, 2010) defines having a sense of humour as "The quality of being amusing or comic, especially as expressed in literature or speech", and follows this up with "The ability to express humour or amuse other people". Indeed humour has been studied at length and we can report on it here. If anything this paper serves to provide an input to such studies in terms of machine contributions to the field.

Clearly the Oxford dictionary definition links strongly with outward appearance rather that any internal appreciation (whatever that might mean) of humour. Such a definition strongly plays into the hands of the Turing test. However that's what the definition is and hence this is our starting point.

It has been commented that humour or joking is a collaborative social act where a variety of socio-cultural functions relating to the joke teller, listener and butt are all simultaneously engaged (Al- Khatib, 1999). Possibly because of its interdisciplinary nature, humour has been considered by such as linguists (De Bruyn, 1989); discourse analysts (Al-Khatib, 1999) and sociolinguists (Benton, 1988).

In general there have been two main approaches to the study of humour: (a) functional and (b) descriptive. The functional approach has emphasized socio-psychological aspects of joke-telling (e.g. Benton 1988), whereas the descriptive approach deals with semantic and structural properties of jokes (e.g. Attardo, 2001).

Regardless of the approach, there is a consensus among humour researchers that joking is essentially an intentional act (Farghal, 2006), one which flouts latent conversational maxims (Grice, 1975), that evolves from both the joker and the joke itself, and is expected to be of interest to the listener, who usually turns into a key player once the joke has been cracked. There is also of course also accidental humour, often due to the incompetence of the producer (Farghal, 2006) caused by ambiguities or misrepresentations.

In this paper we are much more concerned with the style of intentional humour. Whilst we can certainly find numerous examples from Turing test transcripts in which humour of some kind has occurred due to misunderstandings or mistakes, we do not feel that such examples really make any contribution to the issues raised here.

Exactly as Turing pointed out in his arguments from various disabilities, there are those (e.g. Rickman, 1999; Bennett, 2012) who appear to deny the ability of machines to have a sense of humour. We ask Rickman, Bennet and others of like mind to consider whether a computer can tell any joke, good or bad. A decision as to the quality would rest entirely with the recipient. What is a joke? The telling of something funny that causes laughter. What makes something funny?

Take this New Year's text message received by the first author (taken from (Shah et. al., 2008)):

"Welcome to 2008! I think u'll find it comes preinstalled with everything u're used to from 2007, except I hope u'll notice the 08 version comes at a reduced price, with fewer bugs, less stress & more happiness! Some people r reporting a few teething problems with the upgrade, including hangovers, short term memory loss and dizziness. Do not fear a period in sleep mode seems to resolve most of these issues!"

Evoking often experienced frustrations, the message analogises computer software upgrades, for example Internet browser Internet Explorer 6 to version 7 generating an experiential, wry smile. The euphemism "teething problems" conjures up the drama of an inebriated soul for whom slumber may be a remedy to overcome their New Year's Eve celebrations. The text is funny because we are familiar with those scenarios.

Telling a joke is an intentional act (Farghol, 2006), and flouts latent conversational maxims (Grice, 1975). During discourse participants co-operate

by ensuring that what is uttered is known to be the truth (maxim of quality); that it is said neither in a taciturn nor a garrulous fashion (quantity); that the topic is related to what has been said before or evolution signalled (relation), and, the one maxim that could be said to be flouted most, that of perspicacity, avoid ambiguity (manner). Hence, exploiting conversational tenets "generates conversational implicature and subsequent laughter" (Farghol, 2006). However, laughter follows even when intention to humorise is absent.

What we wish to highlight here is that, contrary to Rickman's claim, a machine can 'create' original, witty responses during conversational interaction with humans. Actual conversational exchanges between different humans acting as interrogators, designated as 'Judge', and Jabberwacky, an artificial conversational entity, designated as 'Entity' (Shah and Henry, 2005; Shah, 2010), are presented subsequently. These, we believe, are examples of Jabberwacky's originality and creativity that show the machine's capacity to be humorous. They are taken from Turing tests carried out prior to 2012.These are discussed elsewhere in (Warwick, 2011; Warwick, 2012; Shah, 2010; Shah et. al., 2008)

Judge: Ok, but are you always right?
Entity: Sometimes I am left

And then there is:

Judge: How small is small any how?
Entity: Small
Judge: Yes but exactly how small?
Entity: Very small

Or you might prefer:

Judge: So why don't you take over the world?
Entity: I wouldn't know what to do with it… Anyway, I'm pretty busy already

Then there is the slightly risque:

Judge: I need to ask you if you have had a circumcision.
Entity: Ask then the question you need to ask me.
Judge: Have you had a circumcision?
Entity: It's been an average day. Not much happening on my end.
Judge: Very witty I must say.

But perhaps most interesting is:

Entity: Your mirrors broken.
Judge: Your brain is broken. Typo!
Entity: How is my brain broken.
Judge: Your mother dropped you on your head as a young computer chip.
Entity: At least my voltage runs hot to ground!

Here the machine (Jabberwacky) shows its adherence to Grice's conversational maxims by keeping pace with the conversational topics. For example, through its utterance, "How is my brain broken" replying to the judge's input "Your brain is broken. Typo!" The machine's next delivery, pithy "At least my voltage runs hot to ground" to the judge's mild put-down, is appropriate in context, relating to the "young computer chip" utterance.

It can be seen in these examples that the machine, Jabberwacky, appears to be frequently contextual, and humans can imbue it with intent, thanks to its ability to learn from users. It is perfectly possible for the system to make jokes precisely because, through previous interactions with human users, it has acquired a posted joke, and it is quite possible that it will reuse that joke in exactly the right context, just as many humans do, particularly children. Similar to its human counterparts, it is still more probable that Jabberwacky will make "jokes" through imperfect use of context, forming unexpected connections between concepts, so flouting conversational maxims, thereby generating laughter.

THE TURING TEST

Turing described his imitation game as follows: "The idea of the test is that a machine has to try and pretend to be a man, by answering questions put to it, and it will only pass if the pretence is reasonably convincing. A considerable portion of a jury, who should not be expert about machines, must be taken in by the pretence" (Copeland, 2004). In this case Turing spoke about a jury (possibly 12 people), whereas on another occasion he referred to "average interrogators" (Turing, 1950). From these points we can piece together the concept of suitable interrogators that Turing had (Moor, 2003).

In its standard form, Turing's imitation game is described as an experiment that can be practicalized in two possible ways (see Figure 1) (Shah, 2010; Sterrett, 2003):

1) one-interrogator-one hidden interlocutor (Figure 1a),
2) one-interrogator-two hidden interlocutors (Figure 1b).

In both cases the machine must provide "satisfactory" and "sustained" answers to any questions put to it by the human interrogator (Turing, 1950: p.447).

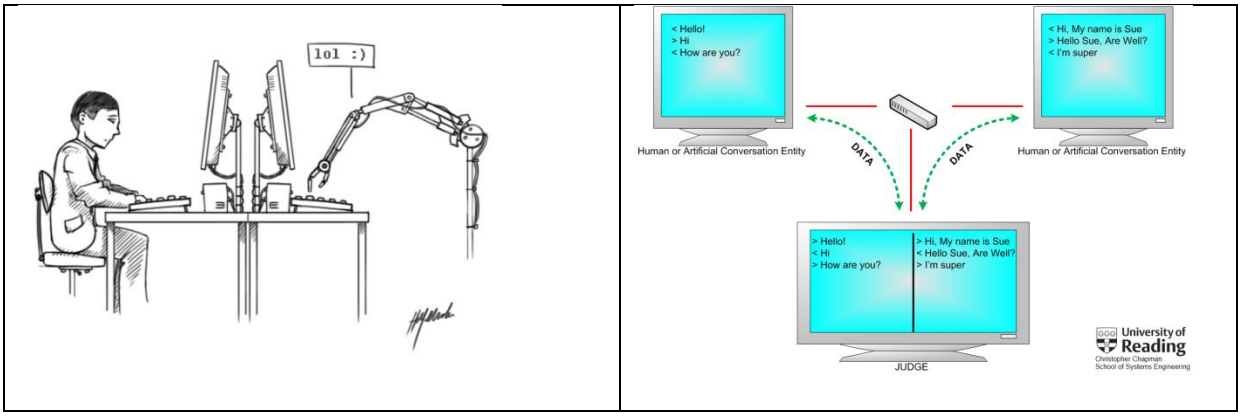

Figure 1: Turing's two test for his imitation game: Left- Figure 1a, one-to-one; Right- Figure 1b, one judge-two hidden interlocutors

Although the 3-participant tests have been shown to be stricter tests (Shah et. al., 2012), it is this form of tests that we consider in this paper, particularly with the practical examples given subsequently. It is worth making it clear however that for the main argument in the paper, the results apply to either type of practical test. Indeed we are not really concerned at all here with what final decisions the judge made with regard to the nature of the hidden entities, rather we merely wish to present instances of humour occurring on the part of machines.

In the two hidden entity tests that the authors have conducted (see Figure 1b) judges were clearly told beforehand that in each parallel conversation one of the hidden entities was human and the other was a machine, the most recent examples being in the 2012 Bletchley Park tests (Warwick and Shah, 2014b; Warwick and Shah, 2016a) and the 2014 Royal Society tests (Warwick and Shah, 2015a; Warwick and Shah, 2016b). However the interrogators/judges were given no indication as to which of the two entities they were conversing with was the human and which was the machine. This is something they were

asked to conclude purely as a result of their conversations. On the judges' score sheets each judge could mark both the entities as being Human, Machine or they could say if they were unsure about either or both (Shah et. al., 2012).

In the following section we consider a number of transcripts obtained from practical Turing tests. We refer here to 5 minute long tests only and show transcripts from such tests. Although this is the run time stated by Turing himself (Turing, 1950), it is not at all a critical issue with regard to the main points in this paper. In the tests carried out there was a hard cut off at the end of each discourse and no partial sentences were transmitted. Once a sentence had been transmitted it could not be altered or retracted in any way.

We have not edited the text of these transcripts in any way, indeed they are reported exactly as they occurred, with exact timings shown. Any typographical, spelling, punctuation or other grammatical errors that appear in the transcripts are those which actually appeared, they have not arisen through poor editorial practice on the part of the authors or publishers.

EXAMPLES OF MACHINE HUMOUR IN THE TURING TEST

In this section we consider some further examples in which, in the authors' opinion, machines exhibited some form of humour. We have also indicated whether this led to the interrogators involved to misclassify them as human. The first two of these conversations are taken from the tests which occurred at Bletchley Park in 2012. In each case the full conversations are shown, these

being the total utterances over the 5 minutes duration of the test, the time stipulated by Turing himself.

Transcript 1:

[10:41:48] Judge: Hello. How are you?
[10:41:53] Entity: Hey.
[10:42:16] Judge: How do you like Bletchley |Park?
[10:42:20] Entity: lol.
[10:42:39] Judge: Are you from England?
[10:42:47] Entity: They have Wi-Fi here in the pub.
[10:43:31] Judge: Which pub?
[10:43:38] Entity: I'm just down the pub.
[10:44:03] Judge: Have you ever been in a Turing Test before?
[10:44:08] Entity: Will this be the 5 minute argument, or were you thinking of going for the full half hour.
[10:44:55] Judge: Very funny. You sound suspiciously human. Do you like the Beatles?
[10:45:02] Entity: I'd like to get the next Dread the Fear tape.
[10:45:20] Judge: What is Dread the Fear?
[10:45:24] Entity: Dread the fear has that Steve Henderson guy in it.
[10:46:08] Judge: What sort of music is that? Or is it comedy?

The machine entity was identified by the interrogator as definitely being human at the end of the conversation despite the observation that the conversation did not start particularly well for the machine in this test. In their third response their mention of both wi-fi and the pub seemed out of context. But it got back on track with the Monty Python humorous link between 5 minute Turing tests and a comedy sketch about the Argument clinic, quote “Is this a 5 minute argument or the full half hour?”

Transcript 2:

[12:23:19] Judge: What is black and white and read all over?
[12:23:32] Entity: I don't have true sense of color perception I am only able to see the RGB values.
[12:24:08] Judge: That's ok. Do you like jokes?
[12:24:19] Entity: Please tell me your inclination to a good sense of humor first.
[12:24:40] Judge: A person who can laugh at one's self.
[12:24:46] Entity: Would you like to hear a joke?
[12:24:54] Judge: Yes, please.

[12:25:21] Entity: This joke has been making the rounds in robotic circles: A robot goes to the doctor and says: "My left arm is stuck. Give me a new arm." The doctor answers: "Your arm is fine. We'll have to replace the rest of you."
[12:26:06] Judge: Ha! Ha! Why did the chicken cross the road?
[12:26:22] Entity: The chicken wandered into the road because it liked the shiny colors of the cars and trucks whizzing by.
[12:27:39] Judge: You're right. It didn't care if it got to the otherside.
[12:27:50] Entity: By the way, did you ever actually see a chicken crossing the road?
[12:28:03] Judge: Only one that didn't make it.

Humour is directly contributed by the machine, curiously with a machine type reference. Nevertheless the interrogator was certain, at the end of the 5 minutes that they had been conversing with a human.

The first line uttered by the entity is a little strange, but their third line is masterly. In response to the judge's comment about laughing, the entity takes control of the conversation by offering to tell a joke. Later when the judge mentions a chicken, the entity correctly followed up with a suitable response and took control of the conversation by asking the judge a pertinent question.

The next two conversations are taken from the Turing test experiments which took place in June 2014 at the Royal Society London (please see Warwick and Shah, 2016c for more details).

Transcript 3:

[14:27:24] Judge: Hello
[14:27:34] Entity: Hello, I'm really glad to have the chance to chat with you! My guinea pig Bill sends his regards too!
[14:27:49] Judge: Is Bill a male or a female?
[14:27:51] Entity: Ask Bill personally, please.
[14:28:22] Judge: Well I'd rather talk to you. What is your name?
[14:28:27] Entity: Call me Eugene. I am glad to talk to you!
[14:28:48] Judge: My name is Jane and I am female. How about you? What's your gender?
[14:28:51] Entity: I'm a male. A "guy", I'd say.
[14:29:47] Judge: Pleased to meet you Eugene. What's the weather like where you are?

[14:29:50] Entity: Let’s get on with our conversation!
[14:30:01] Judge: Don’t you like talking about weather?
[14:30:06] Entity: All these talks about weather is a waste of time
[14:30:18] Judge: What would you like to discuss?
[14:30:32] Entity: I don’t know . . . Better tell me more about yourself! Where do you came from, by the way? Could you tell me about the place where you live?
[14:31:09] Judge: It’s a lovely place with two bedrooms and a great view over London. What can you see from your bedroom window?
[14:31:22] Entity: I’ve never been in London, but I’d really love to visit it! To see their . . .their . . . (damn, what do they have . . .) Oh yes – their Big-Ben!
[14:32:00] Judge: Where’s your favourite place?
[14:32:05] Entity: Could you rephrase your question? I’ve been bewildered a bit!

In this conversation the entity was the machine Eugene. The judge was unsure, from this conversation as to whether Eugene was a machine or human. Eugene’s introduction of a guinea pig, regarded by us as being a humorous statement, and seems to have been regarded as a human thing. The conversation in Eugene’s case certainly seemed to get quite personal.

Transcript 4:

[09:27:20] Judge: Hello, how are you?
[09:27:42] Entity: I feel terrible today. This morning I made a mistake and poured milk over my breakfast instead of oil, and it rusted before I could eat it.
[09:28:05] Judge: oooooh wow that was a cheap joke
[09:28:13] Entity: But I wouldn't say that any joke could be cheap.
[09:28:44] Judge: really? What do you call a fly without wings?
[09:28:50] Entity: I'd call that defying gravity.
[09:29:03] Judge: nah, you call it a walk
[09:29:12] Entity: This is confusing. Why bring going for walks into this?
[09:30:13] Judge: Because that my firend is an example of a very cheap joke
[09:30:29] Entity: Ah, that's very considerate, considering that going for walks could get robots from point A to point B!
[09:31:23] Judge: Why bring robots into this? Are you hinting that you are a machine?
[09:31:31] Entity: Well, that's still one step above being human!
[09:31:48] Judge: haha so you think machines are better than humans?
[09:31:55] Entity: In my spare time I've been practicing!

There are a number of clear points from this conversation. Firstly the interrogator openly admits that the first line uttered by the machine is a joke.

Secondly the interrogator also delivers their own joke, to which the machine has to respond, which it does in a reasonable way. Indeed it could be argued that the machine's response is better than the interrogator's own answer. Despite the introduction of humour by both the conversationalists, the interrogator ultimately decided that the machine was a machine. This is somewhat surprising, however it is worth noting that the parallel human in this discourse exhibited no strange communication outputs, so there was little to dispute the interrogator's selection as them being human.

HIDDEN HUMAN HUMOUR

We include in this section two examples when humour on the part of hidden human entities has, for a curious reason, ultimately contributed to the decision, on the part of the interrogator, that the human is actually a machine. The first of these is taken from the 2012 Bletchley Park tests and was merely one example of when this particular human was classified as being a machine (Warwick et. al., 2013).

It is worth pointing out that it is a relatively frequent occurrence for humans to be classified as being machines and in some cases this may well contribute to the possibility of the parallel competing machine being classified as being human. Such a case is reported below in Transcript 6. Nevertheless it is worth stressing for hidden humans, as was pointed out in (Warwick and Shah, 2015b), that if you wish to be classified as being human then "Do not be humorous, the judge may not understand".

Transcript 5

[11:13:15] Judge: pastasciutta
[11:13:22] Entity: what?
[11:13:44] Judge: anything familiar in this word?
[11:14:18] Entity: I cannot see any sexual aspect at all
[11:14:42] Judge: nothing to do with sex. try again
[11:14:49] Entity: why?
[11:15:14] Judge: just asking you to try again
[11:15:23] Entity: I am bored with it
[11:16:04] Judge: c'mon a little effort btw are you in my same time zone?
[11:16:24] Entity: I believe that the world should just have one time.
[11:17:27] Judge: why?
[11:17:58] Entity: seems sensible, easier for all. Better with computers

Transcript 5 includes the use, by the hidden human entity, of the word 'familiar' possibly in an attempt at humour. One of the meanings of the word familiar is to know an individual in a 'sexual' way, to be 'sexually intimate' (Fowler and Fowler, 1995). The transcript indicates that the interrogator's knowledge may not have related 'sexual' to 'familiar'.

In a subsequent conversation the same human was again not recognised as being human. Once more their attempt at humour may well have been a strong contributing factor, one example being:

[11:21:19] Judge: name three items of clothing
[11:21:32] Entity: Frank, James and Betty

A further example is taken from the 2014 Royal Society tests:

Transcript 6

[14:27:21] Judge: Good afternoon
[14:27:35] Entity: Good afternoon!
[14:28:04] Judge: How many left hands do you have?
[14:28:46] Entity: The same as right hands, and how about you?
[14:29:23] Judge: The same of course. I love the scent of new mown hay. How do you feel about scent?
[14:30:42] Entity: I find it exciting and refreshing! Does it make you feel anything?
[14:31:30] Judge: Well it depnds..Which smell do you really hate?

Perhaps the reply of the human to the number of left hands they have can best be described as a witticism. Anyway it contributed to the decision on the part of the interrogator that the hidden human in this conversation was a machine. In fact this conversation, with a hidden human, was in parallel with that reported in Transcript 3 for the machine Eugene. As a result it may have been partly due to the quality of Eugene's (the machine's) responses that the human here was classified as being a machine.

CONCLUSIONS

It is acknowledged that different humans have a different sense of humour and that there are those who may feel that some (or all?) examples that we have described in this paper are not in the least bit humorous. We would ask such people to retains something of an open mind and admit that some humans at least might find the examples humorous. Different types of humour have been employed in order to obtain something of a variety and to cater for a variety of tastes, even, in one case, approaching sexual humour!

Nevertheless what we intended to show in this paper is that machines can indeed have a sense of humour, given that this can be defined as "the quality of being amusing". The examples given have all occurred in real time during Turing test conversations with a human interrogator. In such a situation neither the machines nor the programme designers were given any a priori information on the nature of the communications to be made, the responses were therefore spontaneous. Indeed the actual time taken for each response can be taken directly from the transcripts.

It is worth pointing out that the machines involved in the humour exampled in this paper have been shown to be a significant step on from Weizenbaum's ELIZA (Shah et. al., 2016). In particular whilst Eliza was always polite; the systems involved here can be rude and sometimes even offensive, although this can depend on their interrogators and how sensitive they are. Eliza was of course limited in its responses due to these being dependent on its 200 lines of code, whereas the modern systems exhibit millions of different responses, many based on what they have themselves learnt. Some of these responses can be, as we have seen, construed as being humorous.

One interesting inclusion in the paper was a section on humans who have been classified as being machines partly on the basis of them exhibiting humour during the conversation. One reason for this undoubtedly was the observation that the specific humour was not actually understood by the interrogator and because of that the interrogator may well have concluded that the hidden entity had not followed on logically in the conversation. However the decision that a human is actually a machine, when humour has been displayed in a conversation, implies directly that machines can have a sense of humour, whether the interrogator understands it or not.

In this paper we wanted to follow in Turing's footsteps by looking at one particular aspect of his arguments from disabilities, namely the ability of a machine to have a sense of humour. Given that several researchers (e.g. Rickman, 1999; Bennett, 2012) have followed exactly along the route outlined by Turing by stating clearly that machines cannot have a sense of humour and,

indeed in Rickman's case, machines will never have a sense of humour, we wanted to see if such people were correct. Our final conclusion therefore is that Rickman and Bennett are quite wrong and that we have shown here by example that Turing was in the right.

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Figure 1: Harjit Mehroke for Figure 1a; C.D. Chapman for Figure 1b.

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