

Inside Robot Theatre
What happens when robots (and children) take to the stage?
By Dr. Louise LePage

Slide-show of photographs documenting the Baxter Project are projected alongside the songs: Robot Man (Connie Francis) and Automatic Lover (Dee D. Jackson).

About the Baxter Project

This performance-lecture marks the close of The Baxter Project. The aim of tonight is to share just a selection of my ideas and reflections about the promises and challenges of performing robots, to give you a sense of the sorts of questions and ideas that have arisen from the process. I will also screen two short films. We will also stage some scenes for you, which have arisen from our workshops and have been directed by Dr. Stella Keramida. Stella has collaborated with a visual artist in order to produce the scene projections and multimedia effects you will see.

The Baxter Project builds upon my preceding research into the implications of robots that perform as dramatic characters in plays. The Project started last November (2015). During the intervening period, it has explored the creative possibilities and challenges of casting the robot on stage alongside human performers. We have conducted performance workshops with students, robot, and sometimes children that have explored dramatic elements such as story and character, as well as theatrical elements including song, physicality, voice, and face. Through these workshops, we have inquired into the forms and relationships of human and robot; interrogated assumptions about human beings and machines, and the kinds of narratives that structure them; and explored performative ingredients necessary for effective sociable robot-human interaction.

At this point, I have few definite conclusions to draw; what I do have, and what I'm going to share with you, are many tentative ones, arising from a project that was always intended to be playful, exploratory, and a first stage of something bigger. From here, I plan to refine my ideas and share my research with a view to conducting more thorough-going and focused research into the performing robot in due course.

I'll start by contextualizing the project and saying something about myself.

I'm a Theatre academic. For a while now I have been interested in theatre forms that engage with the notion that we might be, or be becoming, posthuman.

What is the posthuman?

Posthuman can mean a variety of things but broadly speaking it is bound to the idea that human beings are becoming increasingly enmeshed with, and possibly changed by, technologies. One example of posthuman being at one end of the scale is the science-fictional fantasy of uploading a person's consciousness and memories into a

computer and thereby enabling a kind of digital immortality; at the other end of the scale is the mundane example of a person wearing a pacemaker.

The way in which I am drawing on the term, *posthuman*, in this lecture is a little bit different. I am working from the premise that the world is, or is becoming, posthuman because intelligent autonomous machines will appear side-by-side with human beings with ever greater frequency, raising questions about their potential position in society. Will sociable robots be kinds of kin, not just in social terms but in philosophical ones?

But what are robots doing on our stages? Robots are not traditionally associated with theatre; humans are associated with theatre. Indeed, one might assert with some confidence that theatre is fundamentally a human activity since it offers a site and form for contemplating our human condition, for working through our beliefs, our histories, our politics, our social forms, problems, and challenges, and so on. Up until this moment in history, and outside of science fiction, robots have not had an awful lot to do with such contemplation. However, the new millennium has brought with it technological changes. Robots are becoming a part of our world; given this, they are moving onto our stages.

Though robots are new to theatre stages, automata have a long history there. Automata are close kin of the robot: the automaton, like the robot, signals a life-like and apparently autonomous machine. The theatre scholar, Kara Reilly, in her book, *Automata and Mimesis on the Stage of Theatre History* (2011), tells us that automata such as The Mechanical Turk (a chess-playing automaton); and Jaquet Droz's automata, which played musical instruments and wrote, were first and foremost entertainers. She designates robots, in contrast, as workers.

According to Reilly's positioning of these objects, the automaton on stage works differently to the robot. The stage automaton exists because of human beings' longstanding fascination with machines, where the machine comprises one of our traditional 'others', one of the entities that allows us to know ourselves in comparison. (The other key distinguishing entities have historically included animals and supernatural creatures, such as ghosts and angels.) Sherry Turkle, meanwhile, who writes about the psychology of human relationships with technology, presents certain machines, such as the computer, as being 'test objects' for the human: certain machines are sufficiently similar to the human that they work to challenge human distinctiveness and uniqueness. The human, comprehending her own form as coming under threat from her mechanical other, such as the computer, tends to adapt her comprehension of her own form both by seeing herself by means of the 'other' and by distinguishing herself from it. So, we see a robot, we recognize and are, perhaps, drawn to certain of its features, which seem very like our own, but we also draw away from this mechanical other, insisting upon our human differences, insisting, often, upon our humanly unique and superior features, such as our creativity or our free will or our capacity to feel emotions, for example, all of which might be deemed integral features of the performer.

Turkle proposes that in the late twentieth century, the computer comprised *the* 'test object' for humans. In seeming to think, the computer troubles the Western belief in human uniqueness as comprising essentially rational, thinking beings, a belief that was most famously elaborated by René Descartes' centuries old proposition: cogito ergo sum ('I think, therefore I am'). Turkle writes: 'people tend to perceive a "machine that thinks" as a "machine who thinks" (my italics; 2005, p.29). I find Turkle's position persuasive: an entity that seems to think conjures an idea that the entity has a mind. I think people certainly have a tendency to infer this. Whether or not a computer can actually think, the appearance of thought is sufficient to prompt ontological doubt and make us wonder: what does it mean to think? Do humans think? Might machines think? What is thought?

I propose that the robot is in the process of usurping the computer as the new century's test object (at least in technologically advanced parts of the world): the robot carries forward species specific questions about mind but in addition to this, it has a physical body that is animated and works vividly to pose the questions, 'Can a mechanical artifact find living form?' and 'What is life?' And when the robot finds humanlike form, the question becomes even more specific: we wonder: might a robot become, to all intents and purposes, human?

It is not just our fascination with the machine as ontological other that drives the recent appearance of robots on stage, of course; it is also that we are on the cusp of what the renowned futurist and researcher of robotics and artificial intelligence, Hans Moravec, has called 'The Age of Robots' (1993). Whereas Moravec's proclamation of this age may have seemed the stuff of science fiction at the tail end of the last century, advancements in robotics now make it sound feasible, at least in broad terms. Robotist Guy Hoffman predicts that 'every one of you is going to be living with a robot at some point in your life. Somewhere in your future there's going to be a robot in your life. And if not in yours, then in your children's' (2013, 'Robots with Soul', TED Talk, 16.34). Some humans are already sharing their social spaces and world with fast advancing robots; soon the phenomenon will likely become ubiquitous.

Performance #1

Dehumanised workers construct the robot

Are robots performers?

I want to start this next section by proposing that robots are performers. This goes against the common view: generally speaking people view robots as mechanical workers and argue that only humans are performers.

I mean several things when I suggest that robots are performers: firstly, I mean that robots are appearing as performers on our dramatic stages – I shall share a couple of examples shortly; secondly, I mean to draw attention to the fact that the robot's genesis lies in drama (it was a play that gave birth to the word 'robot'), a point I will reflect on in due course. Even more than this, thirdly, I propose that robots, positioned alongside humans in the world, are inherently performative. It is by means

of theatrical processes and structures that we engage with robots in all kinds of real-world settings: it is their positioning in specific contexts and implied narratives as certain sorts of identities and, sometimes, characters, that prompts particular human reactions to them.

Making such a claim – that robots are fundamentally performers – requires some manoeuvring and clarification in terms of what I mean by ‘robot’ and ‘performer’ – something I shall talk about now.

I am going to start by discussing the definition of the word, ‘robot’.

‘Robot’

The word ‘robot’ derives from ‘Robota’ or its variations in Old Czech, Old Polish, and Old Slavonic, and it means ‘forced labour’ and ‘slave’. The word was coined by a Czech playwright, Karel Čapek, who referred to robots as mass-produced workers in his 1920 play *R.U.R.: Rossum's Universal Robots*.

Reilly positions automata as the forebears of robots. More than this, she argues that in historical terms, the advent of Robots – mechanical workers – spelt the end of automata and that the entities are categorically different: ‘Automata are unique, hand-created entertainers, whereas Robots are mass-produced workers’ (149).

This transition ‘from automata to automation’ (149), Reilly reports, took place in the first half of the twentieth century. Reilly’s view builds from Jean Baudrillard’s discussion in ‘Automata and Robots’ (in his *Symbolic Exchange and Death*), where Baudrillard observes: ‘The automaton plays the man of the court, the socialite, it takes part in the social and theatrical drama of pre-Revolutionary France. As for the robot, as its name implies, it works; end of the theatre, beginning of human mechanics’ (qtd. in Reilly 166).

I am not convinced that the position is as clear-cut as this, certainly not today. I think that the twenty-first century has changed things; it has rendered the position of robots more subtle than this, and here is how.

First, and most obviously, as we moved into the new millennium, robots started to be positioned as performers on theatre stages. Whereas human actors performed the role of robot characters through most of the twentieth century, robots today are playing versions of their own kind on stage. The stage robot is quite literally an entertainer, then. An interesting innovation of today’s performing robot, however, is that, unlike its automaton forebears, which represented human boys or girls or ducks or other living beings, the 21st-century-robot dramatic actor is playing character versions of its own kind. Behind the performing robot is an idea of an autonomous, intelligent, robot individual. The idea of the living human being or animal is still evident in this mimetic context, but now it haunts and structures the location and our understanding of the robot performer and character rather than being explicitly signified. In addition to this, the differences between the autonomous robot and human are as likely to be foregrounded in these performances and plays as are their

similarities. The playwright, for example, is as likely to remind us about the robot character's very different, nonhuman relationship to death, illness, taste, and emotions, as he is to indicate the robot's humanlike capacities for intelligence and linguistic communication.

The robot can, in these terms, be defined as a performer.

But what kind of performer?

The robot: a cognitively estranging object

I want to suggest that the robot's identity, role, and framing is shifting: it is showing signs of moving towards becoming an ordinary agent in social terms. The *Oxford English Dictionary* stipulates that the word 'robot' connects chiefly to science fiction. Historically, in its science fictional contexts, the robot has comprised an extraordinary object, one that was cognitively estranging. The term cognitive estrangement belongs to science fiction studies but its origins lie with the twentieth-century theatre practitioner Bertolt Brecht and his *Verfremdungseffekt*, or alienation effect. Science fiction theorist Farah Mendlesohn writes that cognitive estrangement 'is the sense that something in the fictive world is dissonant with the reader's [or spectator's] experienced world. On a superficial level this difference may be achieved by shifts of time, place and technological scenery' (*The Cambridge Companion to Science Fiction*, 2003, 5). Robot performers inherently possess this capacity for dissonance, not least because they struck, and probably still strike most, people as futuristic entities or 'scenery' cast in the audience's present.

The robot: from science fiction to naturalism

But here is my point: whereas the science fictional contextualization of the robot might have been accurate in the past, I suggest that our technologies are advancing at such a rate that the robot is becoming an increasingly familiar and ordinary object in our world; it is moving beyond the fabulous and science fictional and entering the realm of the mundane and science fact.

This shift has implications for the form that the robot takes on stage. In 2006, a mere ten years ago, these robots [[image shown – Heddatron robots](#)] appeared on stage in New York in a play called *Heddatron*, by Elizabeth Meriwether. To my knowledge, this was the first play to cast real robots as performers of characters in dramatic theatre. As you can see, the robots looked like something out of 1950s or 1960s television sci fi. In this play, the robots were humorous, quirky creatures, whose performances might best be described in terms of queer performance. Their performances of male human characters were playful, loud, knowing failures. There was something magical about them, too: they literally appeared on stage in a puff of smoke.

A mere six years later, a humanoid robot, Geminoid F [[show image – Geminoid F](#)] was cast in a Japanese adaptation of *Three Sisters: Android Version*, a naturalistic play by the writer and director, Oriza Hirata. The play was based on Anton Chekhov's 1900 original. The robot in this adaptation performs the character of the third and youngest of the sisters in the play, and she is a very human-like individual in

appearance, in her dialogue and action, and vocally. There is a spirit of sincerity and seriousness to her form and performance – she is no gimmick.

The shift that is evident in the robots' appearance and dramatic forms across the two plays of *Heddatron* and *Three Sisters: Android Version* is stark as they travel from the kitsch of science-fiction fantasy to the lifelikeness of naturalism.

The robot: a worker or performer?

I want to return to the idea of the robot as a worker versus a performer. Reilly's division of machines that entertain from machines that work is conceived as a kind of historical line roughly drawn through the middle of the twentieth century. Theatre academic Nicholas Ridout differently positions the distinction between entertainment – or leisure – and work by suggesting it runs through modernity (in *Stage Fright, Animals, and Other Theatrical Problems*, 2006). To put it simply, Ridout's argument is that, though theatre may present the actor's stage activity as play and the stage itself as a place where entertainment is consumed, the actor is, in fact, a worker. Imagination and play inform the actor's work but the fact that a dramatic play or musical in the West End may be performed eight times per week over months, if not years, makes the actors workers: their labour is repetitive and may, to a significant degree, be 'programmed' by the play text alongside the creative but controlling director.

Before leaving this point, I want to return to the fascinating point – for me, anyway – that the word and idea of 'Robot' originated with a dramatic play. Capek's play, *R.U.R.*, was a theatrical hit and there are reports that children who saw it started playing at being robots while toy manufacturers started to produce robot toys. I think that the theatrical genesis for, and the framing of, the robot in such a context undercuts its straightforward identification as a mass-produced worker: these Robots are imaginative representations of mass-produced workers, conjured by an art form that intends, in the terms set out by Reilly, to entertain, while at the same time comprising labour for its performers. Also, while it is true that this play, *R.U.R.*, originally conceived the Robots as workers, it is worth bearing in mind the narrative complication of this play: part way through the play, these Robots attain self-awareness. Upon doing so, they rebel against their destiny as workers, rising up against their human creators and owners to take ownership of their lives and futures. Some of the Robots, furthermore, go on to experience emotions, including love, and in so doing, they become human-like, newly conscious of themselves and the world, innocent, cast in the mould of Adam and Eve in the Garden of Eden.

There is much more that could be said on the subject of whether or not a robot should or could be classed as a performer. It is a complex topic. There is, for example, a whole other argument to be had about the status of conscious awareness and intentional action in performance. For performers to be performers do they have to know that they are performers? Do they have to have the capacity to bring their own creative and intelligent agency to bear upon their performance? If this is the case, then most stage robots cannot be classed, at this moment, as performers.

[Improvised section] Having said this, I want to make a side point. There is one example [of a n intelligent performing robot]. Last year I went to see a play – a hybrid of a play and opera – in Berlin by Gob Squad called *My Square Lady* (2015). I think this was a first: this performance featured an autonomous learning robot that played the part of Eliza. While this robot had been programmed, it wasn't programmed to do or say certain things on stage; nobody knew exactly what the robot would do. So, in fact, we are moving towards the idea of the robot as being in control of itself.

Baxter and his puppeteer: posthuman performance

[Returning to script] However, coming back to most robots, including Baxter, they are mere mechanical puppets, operated by a human controller either on or off stage, either in the moment of performance or else in advance of it in the form of pre-programming or pre-recording. But this positioning of the robot as a puppet presents yet more questions. If the puppet is not a performer, is its human controller or programmer the performer? Or is 'the performer' in such an example best conceived as a totality, as the combination of the stage robot and the human controller of the robot? In this instance, 'the performer' is conceived in cybernetic terms as a human-machine hybrid and we are cast into definitively posthuman territory.

One of the questions discussed by the Baxter Team and explored in the workshops was: what kinds of social roles might robots take? What roles would we like them to take? What makes us laugh? What seems plausible? When Baxter performs different identities and roles, which do we like, which do we warm to?

I am going to show you a short film now that we made, composed of interviews between Baxter and a number of volunteers. Using only text flashed up on Baxter's face, we – or, rather, Baxter – asked interviewees to reflect upon a series of questions. I wanted not only to know their answers but also to see how they behaved with Baxter, a robot whose only signs of character or liveliness were derived from his questions, his limited head movements, and a very few, very simple, indexical, and clunky facial expressions. The following short film gives a sense of the range and form of answers, attitudes, and behaviours.

The film will be immediately followed by a series of short episodes, which had their origins in our workshops. These also focus on the question of the robot's potential social roles and our responses to them.

Play film: *The Baxter Interviews*

Performance #2

Who Am I?

1. Baxter in the City
2. Baxter the Butler
3. Mrs. Baxter and the Tea-Ladies
4. Patricia-Baxter: Lady of the Night
5. Baxter Gangsta!

Robots as sociable performers and the importance of empathy

As we move into the future, there seems no doubt that robots will find forms amongst us as sociable participants. They are already becoming so. They are becoming, in short, social performers.

Manifesting human empathy for robots will become important if robots are to effectively perform their roles as sociable or interactive robots in our future lives. If a robot is to take on the role of companion or nurse for an elderly person, for example, then I want to hazard a guess that that robot will need to give the illusion of some kind of individuality, some kind of personality. A talking toaster is never going to cut it.

So what are the ingredients for giving the appearance of animated individuality? This is a question I have started to ponder by reflecting upon theatrical robots.

The robots on stage are never anything other than themselves; they are definitively not their characters where these characters are generally sophisticated machines with personalities demonstrating artificial general intelligence, also known as strong AI, a form of intelligence that signals the full range of human cognitive behaviours. My understanding is that no machine has yet attained such intelligence although research is pushing in that direction. Positioning robots as performers in dramatic plays, then – with their conventions including narrative structures, characters, action, and dialogue – and prompting audiences to imaginatively and emotionally engage with these mechanical characters, is to perform something of a magic trick, or hypnosis. If the trick is performed well, if the illusion or hypnosis is effective, then the robot is turned into the character it is playing. However, it is we, the audience, who ultimately, imaginatively, transform these machines into complex psychological and emotional human-like beings. My hunch is that we are biologically hardwired to intuit psychological depth from certain features, or combinations of features – such as movement, the presence of eyes, responsiveness to an environment, etc. From these cues we add contour to, and colour in, the robot with our own subjectivities and expectations.

Key ingredients for the representation of a robot individual

Movement is one of the key ingredients in this magic trick. Baxter is tonight being moved by a human controller called Josh. (Give us a wave, Josh.) A number of important theatre theorists have engaged in research in relation to the animation of stage robots by focusing on movement, including Elizabeth Ann Jochum and Sita Popat. I am not aware, however, of any academic research pertaining to robots in theatre studies that is interested in expressive elements. In order to explore the expressive potential of Baxter, during the course of this project, I have focused on his head movements; simple graphic facial expressions; to a limited degree, voice; and to his positioning in specific scenarios as particular identities and characters. In setting about this experimentation, I have left movement of his arms almost entirely unexplored.

My approach has revealed several things to me. Firstly, it has confirmed the importance of movement; it is quite literally vital! The relative absence of movement in our performative explorations – and here I discount the movements of Baxter’s head – has often had the effect of limiting Baxter’s seeming liveliness. Having said this, the absence of movement enabled me to start to gather a sense of the importance of these other expressive elements, which play their part in indicating a kind of character and interiority for the robot.

There is something about the movement of the head and the face that I think is particularly important.

The role of guided projection

Referring to the ‘Rorschach test’, the art historian and critic, E.H. Gombrich, posits that our recognition and understanding of objects is dependent upon our pre-existing concepts. He writes:

What we read into these accidental shapes [formed by the blottings of the test] depends on our capacity to recognize in them things or images we find stored in our minds. To interpret such a blot as, say, a bat or a butterfly means some act of perceptual classification – in the filing system of my mind. I pigeonhole it with butterflies I have seen or dreamed of (*Art and Illusion: A Study in the Psychology of Pictorial Representation*, 6th edition, 2002, 155).

Gombrich refers to this process as ‘guided projection’.

The face and movement of the head were two elements I sought to inquire into when I set up the interviews between Baxter and his twelve volunteers. These elements are also evident in the film I made of our making of *Hamlet*, which casts Baxter as Hamlet. (I will play you this film shortly.) In this film, the result is more humorous than sincere, as the Baxter’s clunky facial expressions are juxtaposed with Hamlet’s highly complex philosophical musings. Nonetheless I think they contribute something to the overall effect of Baxter as Hamlet. If Gombrich is correct, and if I may be permitted to add the animating principle of movement into the equation, then when we see something that moves, that has a face and/ or eyes, a voice, a body roughly approximate with our own, and that is responsive to its environment, we humans tend to bring our concept of a life form, even a human being, to bear upon the representing object; we conceive it as being like us. This has fascinating implications for the nature of Hamlet the character, of course, who, I suggest, comes into view as significantly formed of the reader or audience’s own subjectivity.

My Hamlet film was an attempt to explore a number of things arising from the challenge of casting an industrial robot as a highly self-aware, intelligent, and self-determining humanist subject. Could I conjure a kind of subjectivity and character for this machine, and which dramatic and filmic cues might be effective in doing so?

The film, called *Machine-Hamlet: To be, or not to be*, is metatheatrically framed and locates itself in posthuman terrain: it presents Baxter the robot side-by-side with

human performers being directed in rehearsals for Shakespeare's play. By virtue of this framing, I mean for the film to imply an essential correspondence between robot and human – both robot and human are, I mean to imply, physical, 'programmable' performers of dramatic characters.

Play film: *Machine-Hamlet: To be, or not to be*

For anyone who is interested in the ideas and methods supporting this film, material will be appearing on my website shortly, including some recordings and reflections about our experimentation with **Baxter's voice**. There is much more work to be done in this fascinating area of voice. Having worked with a member of our team, Katherine Olive, on producing the various voices for Baxter, I realize how complex and rich this area is and how much work and research I will have to do to engage with it properly and understand it. At present, I have scarcely scratched the surface.

There is something, for me, that is strangely innocent about Baxter as Hamlet in this film, a kind of vulnerability and disorientation, which I find a bit endearing.

It is to the subject of innocence versus experience that I now turn as I introduce the two children, Alyssa and Lucien, who have been involved in this project. Here is their scene.

Performance #3: The Children's scene What Will I Be When I Grow Up?

Children, performance, and the robot

I am interested in children as they pertain to my inquiry into the nature of performance. When the robot is on stage, it is not transforming itself into something else; it is always concretely itself and its transformation arises from the engagement of the audience with the robot, which is matrixed by the parts and processes of dramatic theatre.

A scale of acting?

I am intrigued by the status of children as actors. It occurs to me that they might be considered as locating on an acting scale somewhere between robots and skilled adult actors who physically manage to commit themselves to the fictional role and in the process, manage to some degree to transform themselves into something else. Children like Alyssa and Lucien are manifestly themselves on stage. It is true that we have not asked them to transform themselves into a role for tonight's performance, but I can affirm that, lovely young performers as they are, they do not yet have the sophisticated skills of a Ben Wishaw or a Maxine Peake.

Innocence and experience

The child performer's status also resonates with the robot performer in its 'innocence'. My reflections on this point are tentative and I have no arguments as such to make – I have much research to do in in this area. But the status of innocence

in relation to the robot performer, which reminds me of the child in some ways, strikes me as important.

Both child and robot are innocent in the sense that they both conceptually lack a sense of themselves in moral terms. Indeed, for the present the robot has no sense of itself at all. The robot, to some degree like the child, is full of potential to become either good or bad through advancing technological knowledge and skill and through its experiences of the world.

I find it note-worthy that a number of robots being constructed today outside of the realm of the military are diminutive in size: Myon (pronounced 'Miew-on'), the autonomous learning robot I saw perform in a Gob Squad production of *My Square Lady* last year in Berlin is the size of a child. The robot Pepper is similar in size to Myon and Neo is even smaller, almost doll-like in proportions.

Assigning a robot a diminutive size almost certainly serves to lessen the fears that many people carry about robots at the same time as stimulating empathy and engagement in them. Positioning such juvenile-seeming robots in sophisticated roles, then, may be something to avoid.

The child, the robot, and the uncanny

On the subject of children in dramatic theatre, Ridout writes the following:

The precocious child is uncanny and (on stage at least) unpleasant, because of its knowing, or not-knowing-enough imitation of the imitations of its adult colleagues. They tend to appear as mini-adults, and some of our unease at their appearance seems to arise out of a sense that they are learning, and displaying too much too young. (99)

I asked the children to rehearse a short dance to Connie Francis's 'Robot Man', which you have seen them do tonight. The song is upbeat and fun as it relates a woman's professed desire to find a robot boyfriend because, by implication, men are insufficiently reliable or attentive. The children, Alyssa and Lucien, are too young for the implications of such a narrative frame, for the performance of such romantic roles, which reflect upon our reading of them. The child performer is 'co-opted into patterns of [adult] intention [and knowledge]' (Ridout). This has the effect of drawing child and adult, or robot and human, closely together and, according to Ridout's argument, results in an uncanny effect (102). The humanist stage alone appears to be matrix enough to generate this uncanny effect. If this is the case, then no robot or child or animal can take to the stage without producing the illusion of intention (102).

Sigmund Freud and 'The "Uncanny"' (1919)

I am going, now, to talk a little about Sigmund Freud's theory of the uncanny. For Freud, the 'uncanny' 'belongs to... all that arouses dread and creeping horror' in us (1). It identifies the feeling of disquiet we might experience upon seeing a marionette apparently come to life or getting lost in a fog. Sometimes, observing a robot can incite such uncanny feelings. I am interested in why this might be. Why do we

experience an uncanny response? And what does this reveal about our beliefs about ourselves? I am also interested in the uncanny because Freud's theory interacts with, and informs, another important theory, posited by a robotics engineer that suggested that designing a robot to look and move in certain specific ways could result in enhancing affinity or prompting feelings of revulsion in human audiences for the object, be this a puppet, prosthetic hand, robot, or whatever.

Let me start with Freud's theory and what it signals. Freud writes that 'the "uncanny" is that class of the terrifying which leads back to something long known to us, once very familiar' (1-2). He adds: 'this uncanny is in reality nothing new or foreign, but something familiar and old – established in the mind that has been estranged only by the process of repression'. Freud suggests that that which is uncanny is that which has been, and should remain, out of sight at the same time as striking us as somehow familiar.

I am interested in this idea of ambivalence in terms of our feelings towards an object such as a robot: how it can simultaneously signal something comfortable and familiar and also something that needs to be hidden and repressed. A German psychiatrist, Ernst Jentsch, had already written on the subject of the uncanny when Freud came to consider the topic in 1919, and Freud quotes Jentsch when he observes that the uncanny manifests in 'doubts whether an apparently animate being is really alive; or conversely, whether a lifeless object might not be in fact animate' (Jentsch qtd. in Freud 5). Here we move towards more specific causes of this feeling of unease, which circulate around the question of life and who or what has it – about whether such objects as 'wax-work figures, artificial dolls and automatons' (4) might really be alive.

Jentsch's reflections, repeated by Freud, strike me as provocative and revealing as we consider our human responses to some robots: in all the examples Freud lists here, the uncanny arises from the suspicion and fear that, though we think ourselves mysteriously alive, we might, in fact, be nothing more than really complex machines that only appear to be alive. Furthermore, if this is so, if humans are just complicated sorts of machines and not alive in any mysterious spiritual sense, then another suspicion comes to light: that machines might at some point achieve life themselves – perhaps a different quality of life, but life, nonetheless – and that our human difference from such machines is less clear than we thought.

Freud also suggests that the robot serves as an object upon which we humans invest all our – to quote Freud – 'suppressed acts of volition', all the things we might have done but did not do, including acts of aggression and destruction. Freud suggests that we invest all this potential, all this unperformed action, into the double – in the case of this lecture, the robot – and in the process, the robot takes on 'enhanced symbolic import'. It becomes an object that is a machine but it is one upon which we project our suppressed fantasies and fears. It becomes saturated with potential: the potential to destroy and the potential to be superhuman, in the best senses of the word. But whatever meanings we consciously or unconsciously ascribe to the robot, in responding to particular empirical and imaginative prompts in the appearance and framing of the robot, we have a tendency to conceive of it as a potentially living

individual that is nearly like us and we wonder, as science fiction shows: Having given the robot life, how will it behave towards we humans? Do we think we deserve its compassion and cooperation or its resentment and aggression?

In Mary Shelley's *Frankenstein*, the scientist, Victor Frankenstein, ran away from his creation, terrified, having failed to think through or plan for the possibility that he might actually be successful in creating a living, thinking individual. The creation becomes monstrous through his lonely, unguided experiences through a largely fearful and cruel world, becoming bent on taking revenge on his creator. In Karel Čapek's *R.U.R.*, meanwhile, as already discussed, the robots rise up against their human masters, slaughtering them as they set about creating a new robot order and claiming freedom for themselves. To take a much more recent example of a robot rebelling against its human creator, we find in the film, *Ex Machina*, the robot creation, Ava, located as a kind of rat in a cage, demonstrating particularly sophisticated artificial general intelligence, which enables her to scheme her way out of her prison, and in the process kills her human creator and captive. These and other such stories simultaneously provoke wonder and fear in us: we marvel at the robot creations and at the abilities of the human creators; and we fear that in making robots in our image, while gifting them superhuman powers and skills, that the robots may decide that we humans are surplus to requirements.

I would like, now, to present our final performance, a scene that plays with notions of the uncanny and the provocative posthuman notion that our 'other', the robot, might one day itself make humans.

Performance #4

Uncanny Posthuman Futures? When robots construct a human

The Uncanny Valley: the importance of the theatrical in promoting affinity for robots

In this final section of the lecture, I want to consider the theoretical off-shoot of Freud's notions about the uncanny; I want to say something about Masahiro Mori's uncanny valley, which is an important theory for robotics engineering and design but also for thinking about audience response more generally. Empathy, of course, is an important concept when it comes to considering dramatic theatre; theatre-makers frequently want to inspire imaginative and emotional engagement in their audiences by means of the stage action, so some reflection upon this robotics theory potentially has implications for theatre theory.

Mori is a Japanese roboticist. The 'uncanny valley' is Mori's theoretical account of people's reactions to human-like robots. In his essay, written in 1970, Mori argues that the more human- and life-like a robot seems in its appearance and movement, the greater a person's 'affinity' with it, right up until the point when the person realizes, for example, that a prosthetic hand 'that looked real at first sight is actually artificial' (Mori 99). At this moment, Mori says that an eerie sensation replaces affinity. The hand becomes 'uncanny'.

Show short clip of a creepy child robot called Diego-san, created by the Machine Perception Lab at UCSD in coordination with Kokoro and Hanson Robotics: at <https://www.youtube.com/watch?v=N2gcul46Sf0>

My attention is particularly caught by the claims made for the bunraku puppet by Mori. This puppet is, in Mori's view, second only to an ill person in its power to inspire affinity. Mori writes:

I don't think that, on close inspection, a bunraku puppet appears similar to a human being. Its realism in terms of size, skin texture, and so on, does not even reach that of a realistic prosthetic hand. But when we enjoy a puppet show in the theater, we are seated at a certain distance from the stage. The puppet's absolute size is ignored, and its total appearance, including hand and eye movements, is close to that of a human being. So, given our tendency as an audience to become absorbed in this form of art, we might feel a high level of affinity for the puppet. (99)

Mori's observations, here, are revealing. For Mori, it is the puppet's 'total appearance' that underpins the promotion of affinity for it; it is the combined performative impression of its appearance that makes an audience empathise with it. This important idea has underpinned my approach to working with Baxter the robot. Whereas for many researchers, movement is *a*, or sometimes *the*, crucial ingredient in setting about enhancing audience feelings of engagement and empathy for robots, my own aim was to explore some of the other elements that go into creating imaginative and emotional engagement, as already discussed. These elements contribute to the illusion of a subjectivity, upon which we project ourselves, in combination with the theatrical construction of certain settings, groupings, identities, and narratives, which work to situate a performing object as a particular sort of character.

So as I reflect upon my own experiences, I propose that Mori's almost incidental final remark in the quotation is important. I propose that Mori's identification of the theatrical set of mechanisms attaching to bunraku puppetry is important. In short, I propose that the precise nature of, and rules attaching to, the space in which a robot is situated, which key into particular character roles, identities, and narratives, are crucially important in evoking specific imaginative and emotional reactions in audiences, which may be, in some instances, more important than the robot's appearance.

Theatre, I suggest, is an excellent space to explore the possibilities of robot identity and role. More than this, the stage robot, with its potential for uncanny effects, presents an evocative subject of analysis to enable us to see and understand the workings of theatre. Theatre is a space of representation. Conventionally it is a place of fantasy, of storytelling; it is a space for pretense – for the 'magic if', for the playing out of 'what ifs?' and 'as ifs'. Its material performance obeys the laws of physical reality and manifests corporeal objects in real time and space, but the world of the play works differently, overlaying fictional worlds and jumping backwards and

forwards in time. The robot, in being so unlike a human performer and often hugely different to the character it is playing, enables us to perceive the sort of 'binocular vision' that Bert O. States identifies as underpinning the workings of theatre. The robot is simultaneously itself – a physical object – and an object that inspires meanings and imaginings in the minds of the audience.

When we see a robot on stage, then – but I think what I am about to say also extends to robots in real life to an extent – we see, or imagine we see, more than we actually see. If we feel something for a robot, we do so because, along with life, we imagine we perceive a form of subjectivity resonant with our own, and we author, or co-author, the casting of this robot as a particular sort of character and role in a particular sort of narrative.

Q&A

**Audience photographed with Baxter and uploaded to his Twitter account
@ActorBaxter**

**Louise LePage
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