Introduction

Throughout the history of stage and screen, human actors have drawn on a variety of techniques to evoke the emotion of the characters they portray. While systems of learning and practice have varied from school to school and tradition to tradition, mutual core elements still emerge. The acting process, at least within the European Realist tradition, involves interpreting the script or story and expressing the action and emotion of the character portrayed using the instruments of body (visual) and voice (audial). This approach has indeed moved beyond live theatre and has become dominant in popular entertainment media such as cinema and television. Even in animation, where physical embodiment is transcended and the visual instrument is replaced by the drawn image, similar mechanisms apply. In 3D computer animation, sequences of images are simulated rather than directly drawn, with much of the functionality being automated by the digital systems responsible for the simulation. Recent advances in computer graphics technologies now enable these simulations to be performed in real-time. The implications of this are significant. The research I am undertaking explores the extent to which significant parts of the process can be automated. The aim is to develop a responsive palette of movement styles, gestures, poses, and expressions that is able to modify the primary actions of a computer-simulated character (in real-time) in a way that resembles the convincing portrayal of emotion. This becomes highly pertinent in fields such as videogames, where software controlled virtual characters need to respond to interactively triggered scenarios in a convincing and hopefully meaningful way.

The routes of European realism can mostly be traced back to Konstantin Stanislavski’s work at the Moscow Arts Theatre in the early 1910s, so it seems appropriate to explore his own attempts to document his ‘system’ as a first initiative. This paper therefore playfully

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1 I presented this paper as one of the early outputs of my PhD research, which I have been undertaking alongside my day-to-day job as Head of Games Design and Development at the UK’s National Film and Television School. Like many cross-disciplinary PhD projects, my research includes areas with which I have some experience and familiarity, and other areas which are relatively new to me. I am far from an expert in either theatre studies or actor training methods, and I am therefore grateful to those who have advised me in these areas.
imagines the replacement of the fictional acting student portrayed in Stanislavski’s first publication *An Actor Prepares* with a virtual character at the early stages of my own research, discussing the outputs of some of my initial investigations and road-mapping its future progress.

**Preparing the Avatar**
The aim of my research is to be able to teach a virtual character to ‘act’. This means getting a collection of pixels\(^2\) to behave in a way which begins to convince us that it is performing something we can start to recognise as dramatic, even real.\(^3\) The question that the research poses is therefore: ‘Can a software-controlled, autonomous avatar perform or behave in a way that has the potential to elicit an emotional response from a spectating or playing audience?’ In short, can a virtual character portray real feelings?\(^4\)

In order to teach an avatar to act, we will need, among other things, to develop a set of behaviours that give the avatar the semblance of responding convincingly and with emotional authenticity to any situation an audience could perceive it finds itself in. The avatar would need to respond to what Stanislavski in his early writings referred to as ‘given circumstances’ and to appear to ‘live the part’ played, which Stanislavski referred to as ‘perezhivanie’ - loosely translated as ‘living through’ (Stanislavski 1936).

But what does this really mean? For an actor to bring a character to life–on the stage at least–s/he needs to convince the audience not only that the actions and behaviours are authentic and believable, but also that these actions and behaviours, which emanate from the character’s thoughts, emotions and responses, are taking place spontaneously, ‘in real-time’. Indeed, one of the great pleasures of live theatre is watching skilled actors improvise, creating something unanticipated.

A convincing performance by characters an audience knows to be unreal is a significant feat. Yet it is something that the world of animation has managed to master over at least the past 100 years. Sequences of drawings or computer generated graphics which flash before our eyes at between 24 and 30 frames per second\(^5\) are eminently capable of making us laugh or cry. But it is only the meticulous efforts of teams of artists, animators, voice actors, and many

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\(^2\) A *pixel* is a digitally imaged picture element, the smallest component of a computer graphics image.

\(^3\) The term *real* is used with some care. It is not the ambition of the research to fool the spectator’s eye into thinking something which is synthesised is actually photographic, more to create an emotional connection between the audience and the character portrayed.

\(^4\) In this paper I use the terms ‘avatar’, ‘virtual actor’ and ‘virtual character’ interchangeably. Later on in my research process I will attempt to firm up the most apposite use-context for each term.

\(^5\) 24 frames per second is the framerate of projected film, whereas 25 or 30 is that of television broadcasts.
others that allows for this to be achieved. However, since its early days, animation as a medium has had its roots and aspirations embedded in the performing arts, exemplified in the lightening sketch performances of exponents such as J Stuart Blackton and Georges Méliès (Maltin 1980); and long before and long since, puppeteers and ventriloquists could be considered the animation world’s very own improvisers. Nevertheless, these are exceptions which prove the general rule: animation is a recorded medium with minimal potential for theatrical spontaneity.

It is in the more recent arena of videogames where the biggest potential for spontaneous and emotionally rich character performances lies. Videogames transform the spectator into a participant⁶; the audience into a player. The actor’s equivalent can now be more than a recorded entity whose movements and gestures are animated in advance of its performance.⁷ Computer-generated characters can be procedurally-animated in real-time; they can move, gesture, perform actions – even speak – instantaneously controlled by the cleverness of software code, and enabled by the powerful audio-visual capabilities of the modern graphics processor. This means that virtual characters in games can respond interactively to the actions and choices of the player. In most cases these responses can be instantaneous, but whether the responses in most games are convincing, life-like and emotionally rich is another question entirely. For players to be as empathically involved in the stories that games portray – as drawn in as they frequently are in theatre, film and animation – requires not only a spontaneity of performance but also an extensive repertoire of emotional reactions and responses which can be built into the computer code, such that combinations of these can be evoked and portrayed convincingly in the right setting and at the right moment.

A simple incarnation of this is already a familiar feature of many videogames. Survival, combat and competition arguably involve the most basic level of human emotion (Ekman, 1972), so it is perhaps no surprise that there are plenty of videogames in which virtual characters fight, attack, defeat or kill other virtual characters that the controlling code has deemed their ‘enemies’. Conversely, plenty of virtual characters can be coded to appear to struggle for survival, or to avoid defeat, injury or death.

The prevalence of these types of performed behaviours in early videogames is because it is relatively easy to create them convincingly in procedural animation terms. The movements, gestures and actions are easily automated, and the avatars can perform them with a degree of

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⁶ This is in contrast to cinema, but not necessarily contemporary theatre where participation can be central to audience experience.

⁷ Although in many cases, game characters are still pre-animated and therefore their performances pre-determined.
military precision. But when the emotional encounter is more subtle, and the range of situations more nuanced, the challenges are infinitely bigger. How can we automate the variability and subtlety of behaviour in the early days of a budding romance, the will-we-won’t-we emotional excitement of a first date? How can we get our avatar to convincingly show political empathy, professional rivalry, fraternal jealousy, or indeed any other higher level of emotional response to a situation that may arise or that a player’s actions may evoke?

Furthermore, in this post-photographic age of ubiquitous synthetic imagery on our cinema screens, how can we cheaply and efficiently animate huge crowd scenes of humans in varying states of turmoil and complex emotional response to a particular cinematic storyline, so that each one of them looks like an individual, with a real backstory, and an individualistically nuanced performance within whatever given circumstances the story offers up?

**An Avatar Prepares**

It was a cold crisp October morning at the Moscow Arts Theatre Studio. A new batch of students waited expectantly in the backstage studio, for this was their first encounter with the master, the reason why they were all there, their chance to learn from the greatest actor, director and mentor of his time, Konstantin Sergeyevich Alekseyev. The great ‘Torstov’, to those around him.

A handful of the students had carved out their own personal spaces within the studio, moving and stretching as if limbering up for a gymnastic performance. But there was one student who did none of these things. He stood alone in the corner near the door, breathing, shuffling, shifting his weight from one leg to the other. It was all natural, normal-seeming, at least at first. But after 35 seconds – exactly 35 seconds – his movements appeared to repeat: every breath, shuffle, shifting of weight, adjustment of clothes reoccurred, as if he was caught in an infinite time-loop. An idle loop.

At last, the master arrived.

“I am Torstov,” he announced. “And I am going to turn some of you into artists of the stage. The silence had turned to fear. “Allow us to start. Perform for me. Choose a small section of a play, and stage it – in pairs or small groups – availing yourself of the stage and its props and facilities. My one instruction. Be true. Make me believe”.

“I think you’ll find that’s two.” A lone voice from the back corner by the door dared to break the silence. All heads turned.

“We will find that’s two.” Torstov marched toward the insurgent, barely containing his indignation.

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8 This was Stanislavski’s birth name, and Torstov was the name of the self-personified director/teacher he used in the book, whom I have elevated to the status of a professor.
“And who might you be?”

The student appeared to hold his cool. “I am whoever I’m needed to be, as a character that is. But as a default, I’m normally known as Chuck”.

“Chuck?” Torstov tried out this strange sounding name, holding the resultant shape it made on his lips in place a little longer than necessary.

“Yes. I understand my programmers named me after Charles Babbage, it’s a diminutive.”

Torstov did not know how to respond. Chuck filled in the awkward silence.

“I apologise if my precision and accuracy of observation was inappropriate to this situation. I was initially programmed to smooth out motion capture errors. My programmers say that if I apply my bug tracking functionality to inappropriate situations it can (1) offend and (2) make me appear to be on what they call the ‘spectrum’, although the latter is not something people here would know about for at least another 40 years.”

Torstov was uncharacteristically silenced by Chuck. His clothes, mannerisms and demeanour were absolutely consistent with a young Muscovite of average means in early 1900’s Russia. And yet the way he communicated was distinctly other-worldly. Eventually Tostov shook off his distraction and squared up close to Chuck to deliver his challenge.

“YOU. You will be the first. You will show me truth. You will make me believe. Do you accept?”

Chuck accepted without hesitation. “I’m here to learn professor. I’m at the start of my journey. What would you like me to play?”

“Othello.” Torstov announced. “And you,” he continued, grabbing the hand of a confident attractive young woman at the front of the class who introduced herself as Stella, “will be his Desdemona”.

The next day, the student actors gathered on the main stage. At the front, and ready for curtain up, Chuck and Stella. Stella looked stunning, having availed herself of the costume department, preparing her hair and makeup to perfection, reclined on the stage bed. Chuck had magically transformed his appearance, costume, stature, and skin-tone, to match the celebrated stately moor. It was uncanny.

“Othello Act Five Scene 2,” Torstov ordered “Begin.”

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9 Through various accidents of fate, mistranslation and bad timing, Stanislavski’s practices were misconstrued and misrepresented in the USA by Lee Strasberg in the 1930s. However it was the great American actress Stella Adler who realised that Strasberg’s ‘Method’, aggressively marketed by its promoter and therefore widely adopted, was very far from anything Stanislavski himself endorsed.
Chuck and Stella’s performance went well, or so it seemed, as did all the other performances of scenes the students had prepared. Back in the studio the following day, the students seemed more relaxed with each other. It turned out that the most of the group were far from wide-eyed novices and could boast a fascinating diversity of backgrounds and experience. Chuck was impressed in particular by Mikhail, an informed and feisty soul whose uncle was a playwright; Jacques, a passionate French mime artist; Bertolt, a German intellectual with a razor sharp wit; Giacomo, an Italian scientist who seemed to know a great deal about how the human brain works; Kenny and Emma, two young Brits who seemed to have been working on the stage since they were 4 years old; plus Stella of course, who immediately captured Chuck’s admiration and affection.

Tortsov started his review; each group was to be called to the front of the class to receive their feedback. Chuck and Stella were first up.

“Stella, your performance was beautiful, enchanting, and theatrical,” to which Stella beamed with modest pleasure. “Your movements, gestures and voice were correct, and consistent with the text. But you were still Stella, performing your movements, your gestures and your voice to transmit an idea of Desdemona, rather than allowing your transformation into the character of the text.” Stella was crestfallen.

“And as for you, Chuck. Your gestures, actions were mechanical. They fitted the part you played, but were they alive? Most certainly not. Your performance was that of an automaton.” Torstov dismissed it with a swipe of his hand.

“To be expected, surely.” Chuck responded, “I am an automaton, or at least its digital equivalent. I’m made of pixels and vertices. And I can only do what I’m programmed to do. However my motions and expressions are based on a considerable amount of performance data.”

Unclear what Chuck was saying, Torstov moved on. Everyone was lambasted in one way or another. He railed at Bertolt for being too self-conscious in his performance, and at Jacques for being expressionless in face, but far too exaggerated in gesture. Kenny and Emma met with faint approval, but Torstov held that their performances were inconsistent in their emotional integrity and unrepeatable. “Not true art.”

By the end of the day – for that is how long it took Torstov to rip all the performances to shreds, the mood of the room was solemn.

“All of you are working from the outside in. You must learn how to stop acting and start being. You must learn how to live through the part,” concluded Torstov.

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10 Imagined as Michael Chekhov, a student of Stanislavski and indeed the nephew of Anton.
11 Jacques Lecoq, French mime artist, acting teacher and physical theatre pioneer.
12 The great German poet, playwright and theatre maker Bertolt Brecht developed ideas on dramaturgy and performance that were in many ways in stark contrast to Stanislavski.
13 Giacomo Rizzolatti heads up the research team at the University of Palma which discovered Mirror Neurons, thought to be a key factor in human empathy.
14 Kenneth Branagh and Emma Thompson, renowned English actors on stage and screen.
Over the next days and weeks, however, the troupe grew in confidence; they even started questioning the master, answering back. Kenny and Emma maintained that there was no such thing as the character played. They were their own bodies and minds, on stage, doing what they do. Becoming someone else was… psychopathic. Bertolt suggested that the theatre is a political tool, and that the actor should always maintain a removed objective distance from the part being played and the play as a whole. Mikhail and Giacomo both pointed out that it is impossible to rely only on our inner thoughts and feelings to create a performance. “There are things that the human body can do, advised Giacomo, which can evoke particular emotions. And this is done completely consciously. I sense that you yourself will also come to realise this in time, Professor.”

Chuck turned out to be the most committed of students, and initially the most reserved. He knew he was a novice, but seeing the growing confidence with which others began to discuss and even challenge Torstov, he calculated that it was acceptable to question – in the right circumstances. He spoke candidly, for this is all he knew.

“I have no ‘inner’ life. My body and my mind are one. My movements, poses, and diction are my feelings. So please, help find me a way of learning how to use what I have – my geometry and textures – to perform the breadth of emotions that our art demands. Perhaps, for me, to learn to act badly, in your estimation Professor Torstov, is where I must start.”

**Reflections**

The above prose was written quickly, because the key parameters of the main character were reasonably well defined. Chuck’s appearance could easily be convincing, his mannerisms well practiced, even his accent authentic-sounding. However, Torstov’s instructions to him to draw on his own human emotional experiences in order to bring the part to life were doomed to fail. As a compositional experiment, it is, as Chuck reminds us at the end, only the beginning.

Many of Stanislavski’s early ideas revolve around the artist being able to draw on his or her own inner emotional experience and imagination, and express these through their performance of the character played. Clearly, an android such as Chuck would find this challenging, unless their artificial intelligence is filled with extensive subjective life experience. We know that Stanislavski later revealed these ideas as only a small part of the process, and that his later writings promoted a more explicitly psychophysical technique in which movement, gesture and performed expression are as much a part of the performance as the inner simulation of the emotion felt. It is also clear that there is a heritage of theatre practitioners and theorists who have emerged throughout the 20th century. Some of them appear as Chuck’s fellow students, who have explicitly promoted physical movement as the principle means towards emotional expression. This also chimes with recent advances in neuroscience, which shine increasing light on motor mechanisms as the key way humans and animals express emotion in real circumstances, let alone fictional ones.

The task ahead is to embed controlling software with at least some of the skills we know that both actor and animator are equipped with. Perhaps, through this work, an avatar
will be able to go beyond preparation, and not only build a character but eventually create a role.\textsuperscript{15} Thus and only thus will the autonomous virtual character become a genuinely believable entity, capable not only of performing a sophisticated palette of emotions, but also communicating them convincingly through the empathy and engagement of its audiences or players.

\textbf{Bibliography}

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\textsuperscript{15} These phrases match the most widely translated titles of Stanislavski’s two further volumes, each published many years after the original release of \textit{An Actor Prepares}.