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## Robot pet companions for people with dementia: connecting with 'Companotics' today and in the future.

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**Professor Maria Hinfelaar**: Okay, well a very good evening everybody. Welcome to the first of our series of public lectures delivered by our very own researchers within the University. So, my name is Maria Hinfelaar, I'm the Vice Chancellor of the University, and I am delighted to be hosting this really exciting public lecture here this evening.

Great attendance tonight and I'm very pleased to see and to welcome so many students here. I'll start with you, the students, we have students here from Allied Health programs, from Nursing and also from Animal Behaviour over in Northop. So, thank you so much for making the time and coming to join us here this evening.

I'd also like to welcome very many colleagues here in the audience from obviously immediate colleagues, direct colleagues of Jo's, but also from further afield across the University and the Research Office who organised everything and made it all come together and produced a little booklet which gives you the program for the full year. So, make sure you put all of these really interesting sessions in your diaries.

So, by way of introduction then, Jo Pike is going to deliver the first of the series this year and the theme is robotic cats for use in supporting people who are suffering from dementia and how that can actually help the process, can make their lives more comfortable, can improve quality of life and clearly, then also have a role in continuing communication and engagement and it certainly means something to me, with my mother suffering very badly from dementia. So I'm really, really interested in hearing what you have to share with us Jo, so thank you and over to you.

**Dr Joanne Pike**: Thank you very much. Oh, it's such a pleasure to be here. I feel so honoured to be the first person this semester/this year to talk on Wrexham Talks Research.

So, a little bit about me before we start and also a little mascara warning, there may be some elements of this that may touch home, so do be aware of that because it's a very emotive subject and I'm sure a lot of us have got experience of loved ones with dementia. So, I am a social scientist, therefore I'm interested in the meaning of *things* for *people*, so I will be talking about meaning, I will be talking about other important things that mean a lot to us. So, tiny little mascara warning before we start.

So, as you can see, we are going to talk about dementia cats. Not cats with dementia, although my cat at home does have dementia and I frequently see her meowing at the wall or nothing at all, so unless we've got ghosts, which we might have.

So, a very, very interesting story, some years ago my good friend and Stuart’s good friend here, came down to my office with one of these in his arms and said “I've just, just, just got one of these.” Okay. So, Rich is very interested in human robot interactions and things like that, and he said “I've just had one of these” he said, “what can I do with it? What can I do with this cat?” So I said “hum, I don’t know but I am sure we can do something”. Then I said “aha, I know exactly what we can do”, I said “can I take it home?” I took it home, showed it to Mum and I thought, there you go, sorted.

So, I'll tell you the story of how the whole bits of research came into being okay. So, we are familiar, I'm absolutely sure, with all sorts of animal assisted interventions. So, we know that pets help us to feel good. How many people in the audience with pets? Ah, there you go. How many people in the audience with cats? Oh, yeah, I am also a mad cat person, so immediately you can hear some of those themes that I'm going to be talking about, you've got those in your head already, the things that matter to us, the pets that matter to us. They are part of the family, aren't they? They really mean a lot to us. I mean, I would rather be ill myself than my pet be ill, they mean that much to us. But they give us so much back, don't they? They're amazingly intuitive, if you’re not well they come and put their nose on your hand and say, ‘pet me because you're not well, so pet me’, but they give us a lot don't they?

That is a beautiful picture. Also, here, anybody got horses in the room? Yeah, I adore horses. I think there's something very special about horses, but that's another story and I haven't done any research for that. You can see that gorgeous Shetland pony there, giving somebody the time of their lives. Look at his smile, you can't buy that smile, can you? Look at the eye contact, that is absolutely amazing. I'd love to know what the dog is thinking. And of course, we know that dogs are used as assistance dogs for reading and things like that. So, we have PAT dogs, we have visitors to people in hospital of all types of animals, and we have therapy pets as well.

There is, of course, an issue. Who can spot the issue? [audience member says the loss of pets]. That is true, yes, I'm sure we've all lost pets and beloved pets. [audience member says they need care]. Yes, that is one issue, they need care, they absolutely do need care. Yes, and what if you're not able to give that pet the care and love and attention it needs? Then you have a problem. There is another issue with therapy pets, we tend to focus on the well-being of the person, but what about the well-being of the pet? Animal welfare. We are one world, everybody in it, all the creatures in it, need care and attention. So, if we are ‘using’ and I do use that word ‘using’ a pet or an animal as therapy, we need to be sure that that pet or that animal is getting as much out of it as the people that that it's helping.

So, I'm a nurse by background. District Nurse actually, my background most recently before came into education, and I'd often find that people on my caseload, my patients, my services users, my clients, whatever you want to call them, were worried about their pets when they had to go into hospital. They were worried what was going to happen to them. I was equally worried sometimes when I was looking at somebody with poor mobility: “Oh, has the dog been out today?”. What if the person's forgetful, “Have you fed the dog?”. My daughter-in-law is a veterinary nurse and she says often she can spot when somebody isn't coping because they'll do a home visit to the pet, and they can often spot when a person isn't coping and can refer on to the appropriate services. So, there's a lot of interplay between our disciplines, I suppose. But the most important thing for me is what if somebody wants a pet and can't have a pet? They miss out on all that love, that attention, they miss out on the connection.

So where are we? Well, we’ve got a good old teddy bear. I bet everybody, I won't ask you to put your hands up, but I bet everybody in this room has a teddy and if you haven't got one now, you will have had one, for definite. I do have teddies, I love teddies. So, very simple companion, teddies don't ask anything of you, there when you want it, you can chuck it on the floor if you don't want it, but you can't really do that with a pet cat.

Who remembers the Tamagotchi? Yeah, who had to take Tamagotchi to work so that it didn't die. Yeah, yeah, absolutely. So, even then we were ascribing something living to a digital being, a digital thing. “Mum, you let my Tamagotchi die, you fed it too much”, “oh I'm sorry”- I actually did kill it, but the children felt connection. We've got things like Furby, we've got other sort of mobile animals now, but the Tamagotchi is making a comeback everybody. That's from Amazon, they're on sale now, and I'm not on commission.

So, where are we now? Over in the Far East, they tend to like things like seals and cuddly things like that, but they do like cats as well, but there's been a lot of research done on Paro the seal. So, when we were looking at what research we were going to do, we looked at what research was out there and most of it was on Paro the seal. Now, Paro the seal costs at least £2,000. In today's money, probably a bit more, a lot of money. So, it just so happened that Richard got one of these and I think he might have got it from Amazon or eBay or somewhere and when we looked it up, it was a lot cheaper. So about £100/ £99 then; it's a bit more now. So we thought, oh, this is maybe doable. Maybe we can do some research on this without having to spend £2,000 on each robot seal.

So where are we going next then, I wonder? Are we going to be in the future looking at ‘real’ robots? So that's something to think about in the future and if we are, how are we going to communicate to them and with them? And part of my conversation with you tonight is conversation.

My other background, I'm going to pass Tiddles around, I'm going to stop the noise, but he does still purr. So, a sensory device that gives you a bit of feedback, that talks to you, that you can pick up and stroke or chuck away when you don't need to have it next to you, really good. There could be some issues, though. So, what could our issues be? I will talk to you about those in a bit, but have a think about what those issues might be with this robot cat or robot whatever?

So, very cleverly Richard and Stuart came up with the word ‘Companotics’, it's a contraction of ‘companion’ and ‘robotics’ so we've kept that. If you search ‘Companotics’, you'll find our research. So, what we did was, we wanted to find out what it was like for somebody living at home with dementia to have a robot cat. What difference did it make? Did it have any effect at all? What was it like for that person? That was our whole idea and as you can see, you can now get dogs as well. The company do dogs and I'm not selling these by the way, It's not my invention.

What we did was, we set out to find out what it was like for these people to have robot cats in their homes with them. What was the impact? As a social scientist, I wanted to find out in depth stuff, I wanted to ask them, have conversations. I didn't want to give them a questionnaire to tick you know, ‘Yes’, ‘No’, ‘Somewhere in the middle’ and so I wanted to have in depth conversations. The other thing we did, because bearing in mind that a lot of our participants were the people with dementia, the other participants were the carers of the people with dementia. So, in order to stimulate conversation, we asked people if they wanted to take some photographs, so that when I went back to talk to them about the cat, we had some photographs to talk about and it really worked really well and that's called photo elicitation. It was a really good tool for people who don't have very good day to day working memory and it acts as a stimulant for conversation.

So, we're looking at the acceptability of the robot cat in the home. The other thing that we did was we invited people to take part. We put out a call in the in the media and said if you or your relative is suffering with dementia and think that they might want to take part in the study to have a robot cat in home, get in touch. So, they did and that was lovely. We didn't need to go through NHS ethics because we weren't looking at ‘patients’, we were looking at people. We wanted to know from real people what it was like and we didn't want to interfere with any therapeutic interventions from the NHS at all. The other thing we didn't do, was do any measurement of the stage of dementia, because we didn't want to be that medical. We had thought that we would initially, and we played about with that and that sort of thing: ‘how do we know’ and all the rest of it… ‘is it Alzheimer's’ and ‘is it frontal or is it vascular?’, ‘what sort of dementia is it?’. Well, actually, for our study, that was not the thing of interest and we let the people tell their story. So, we've got a story from people with early-stage dementia from their own perspective telling us that “oh, she's early dementia so, you know, we didn't think it would help”, but I'll talk to you a little bit about what they said. We had people with late dementia, so people who were in in quite dire straits, you know, maybe couldn't walk, maybe had quite a lot of repetitive behaviour, maybe quite demanding on the carers, you know, it can be quite a strain.

We ended up with, in the end, we got given 12 cats which was amazing and I was like “Yes, thank you very much” and we went out to see people and we ended up with, at the end, five people. So, we had three people who told us they'd been diagnosed with dementia, three as yet undiagnosed but the carers told us they had dementia, and we didn't record age and it was just the way they presented to us that was the important thing really for the study.

So as always, Mum makes an appearance. She is the inspiration for this. Mum there, you can see, she's quite far into her dementia journey. She's got a sling behind her, she wasn't walking at this point and you can see that her hands are a bit contracted and she's, you know, she's struggling with doing anything with her hands. And Mum was a typical nurturing mum, you know, she would fuss around you, make sure you have a cup of tea, she would feed you until you couldn't eat anymore and she was the light of our lives. That picture for me reminds me of how she was when she was young and the reason it reminds me, is because look at her joy on her face looking at the cat and that means the world. And that's the inspiration for this, trying to bring some light into somebody's life. Part of my other research interests is spirituality, so it's about connecting with others, connecting with the world, finding meaning and for me, there she is.

So, we had some really good conversations when we were doing the interviews, really good conversations. Then when I got all the conversations recorded and I transcribed them all, I looked at them and I did a thematic analysis. I looked through all of the transcripts and found out whether there was anything that was similar coming up and what things could I group together and I ended up with three themes: Connecting, Communication and distraction and Acceptance and rejection. We worked together as a team there to make sure that I wasn't being a bit silly and just putting my own feeling on it because, you know, I am a social researcher, I have my own biases, so we worked as a team and that's a real strength.

Now then, Connecting. I'm going to show you a lovely picture now and you're going to say to me, hang on a minute, you should anonymise participants because we don't want to betray any confidentiality here and I'm going to say, yes, absolutely. However, the family, like me, wanted to tell the story. Okay. So, we have a real life person here telling their story, there she is and Jean is her name. Jean named her pet Polly and you can see that she's silver and white. Jean was what we could call our paradigm case or our strongest case, I think, or our most representative of the positive benefits that we could have in this study. I'll tell you a little story okay, mascara warning, folks. Jean lived in an extra care facility somewhere in North Wales, and she lived in a kind of complex, so she had her own front door, but she lived with lots of other people who each had their own front door and there were carers on site. Really wonderful, really lovely place. So clean and tidy and welcoming and you know, nice when you go in there, some places to be together with others but your own front door if you want to be alone. Wonderful. The carers met me at the front door and Jean's daughter had been the one to contact me, so I met Jean's daughter. There she is at the top right and that's Jean's great granddaughter there, that you can see in the picture.

So, the careers met me at the front door and Jean’s daughter met me at the front door, and she said, “Oh, I don’t know if it'll help” she said, but we used to have a cat and you know, she does love cats and things like that, but she's been really withdrawn. So I said “Oh right, okay, why what's been…” you know, just having a chat, as you do at the front door “what's been going on, you know, tell me a bit more”. So she said “Oh, she's not been getting up in the morning, we're finding it difficult to get her motivated to even get dressed, she's just, yeah, she's not engaging with us” and it was that thing that kept coming back and it was the lack of connection again. You can hear the spiritual things all the while. I said, “Oh well let's give it a go then” and Jean's daughter had asked me for the silver and white tabby because she'd had one similar herself. So, I took it out of the box and I carried it in my arms and the carers were behind me, Jean's daughter was in front and Jean was sitting in her little pink chair and she went, ‘Ah! Where have you been?’ to the cat. Well, the carers were in tears, Jean's daughter was in tears, it was like a reunion. It was incredible. The force of the emotion hit me right square in the chest.

A while back, Jean’s daughter had said to me that a while back the consultant had been out to see her and assessed her and said “look, you know, we need to maybe think about is your mum going to be safe here” and that kind of thing, so the doctors had been involved and this is all from Jean's daughter okay, so I've got no medical notes or anything to back this up, this is what Jean's daughter was telling me. So, she said, “Well, I'm just worried really worried about her, I don't want to…she's happy here, I don't want to go from here”. When I went back, because we dropped the cat off, settled the cat in, told them it didn't need feeding, which was an issue for some people, you know “Do I need to feed the cat?”, “No, you're alright, it has batteries”. I went back and I spoke to them. The whole family came to greet me, you know, it was like walking in and there was the daughter, her daughters and her daughter's children. The whole family was there, so my recording, trying to make sense of it with everybody talking, it was really, really difficult. Jean's daughter taken those pictures and she said, “I'm going to send those to you” she said, “because I want everybody to know about these cats, because look at the difference it's made to Jean” and you can see the joy in Jean’s face there. The picture on the bottom left there is Jane in her nightie. Her daughter wanted that one in because it's telling the story of Jean getting up in the morning to go and see to the cat. It actually got her out of bed, so such power in one of these, you know. See, I told you it was a mascara warning., sorry about that.

Actually, I'll tell you what I'll do, I’ll read some from the transcript:

The cat says “meow”, and the cat does say meow in a human voice, I wish they'd sort that out because that is a bit iffy.

So the cat goes “meow” on the recording, I can still hear it in my head and Jean turns round “Hello, there's a good girl” and I said “she talks to you doesn't she?” and Jean said “Yeah” and then the granddaughter said “the whole family like her don't they, the girls came from… to come and visit and they like her” and the daughter said “yeah they were here last week for a week”, Jean said “Yeah, it was lovely wasn't it” and the daughter said “it was lovely” and she turns to me and she said “You see, she's remembered that as well”. I said, “is that unusual?” and the daughter said “definitely”.

So, not just the impact on the on the feelings and the connection and the communication with the cat, but also almost like another set of connections being made. Beyond the connection with the cat and the carers.

Then I've got a few little quotes from other participants. So, Communication and distraction “Well, we can have a bit of fun with it when she (that’s the cat) is with us, especially with the carers, they think it's real and they jump when it moves” and that was a lovely dynamic because the family and the person with dementia would often talk to the carers about the cats and it added that extra dimension, it gave a the conversation point.

Somebody else said “it looked up at me. It just amuses me. I pick it up at any time.” This lady had quite early-stage dementia, she was she was very with it, and she was still, you know, doing a lot of things.

Then late-stage “I think Gran’s at such a stage that it's difficult for anyone or anything to reach her. It's funny though, that the cat reaches her where we can't always. You wouldn't think it would, would you?”, that's from somebody who's looking after their Gran at a later stage.

Some people accepted the cat, some people rejected the cat. Some people said “Yeah, it's lovely, it's brilliant, it works, it stops me worrying about Mum going out in the middle of the night calling the cat in”. That was one person saying that she would be found at three in the morning wandering the cul-de-sac looking for the cat, but she's been less of a bother and that cat was called Tommy because her previous cat was called Tommy. They'd had to give Tommy up because Mum was getting up in the middle of the night looking for Tommy round the cul-de-sac, she'd just given the cat up and we were able to luckily give her a ginger one similar.

But it doesn't always go to plan. So, this lady here said, after being so positive, she said she didn't want it – “not a real cat, died and it's been stuffed and it's a shame”. So, that didn't go so well, but then she came round. She was captivated by it, and then she started nursing it on the cushion and then she started nursing it on her lap. So, it took a while to be accepted.

Who here is scared of clowns? Anybody? Yeah. Scared of spooky dolls? Yeah. Okay. The initial idea for this, I have to say, comes from my son Phil, who at the time was about 16, maybe 18. I was talking, I'd taken a cat to somebody in a local village and they'd gone “oh” a real, “what the… ?” yeah, an expletive! So I had to hide it and she said “nope, don't like it, that's horrible” and I said to my son “Oh, that's so weird”, I said, “she's got a teddy, she loves her teddies, I show her the cat and she nearly threw it back at me” kind of thing, you know? Phil said to me “well, that's Uncanny Valley Mum”. You know, only a geeky son would know that. I came and spoke to the geek that we've got in the room, and I said “What's this?”, so Stuart looked into this phenomenon of Uncanny Valley. So, not everybody likes clowns, spooky animals, spooky cat, spooky dog, spooky dolls, you know, Chucky? Yeah, so I tried to find the least scary clown on the internet that I could find, you can imagine when I Googled ‘clown’ what I got, so I was like ‘okay, I'll have that one’. So, this phenomenon shows it's a bit kind of like when you can't see the real expression on the person's face or you're trying to interpret what the expression is, and you can't quite get it because it's either too real or not real enough.

Okay, so here's the science. There is a bit of science there, you can see that where you've got something that is not human like ‘happy with that, great, sorted, happy with that’ but the more human it gets, the more scary it becomes until you reach this dip in the middle called the Uncanny Valley where you've got ‘corpses are scary, zombies are scary’, so it's that phenomenon that we're that we're dealing with. If it's 100% human like, ‘sorted’, if it's really not human then ‘sorted’. If it's somewhere in the middle, you have to be really careful. So that's what we were dealing with.

So where are we up to? Well, I think the majority of our people were happy with the cat. The majority of the people that had the cat and liked the cat, got on well with the cat and it was of benefit. Didn't work for everybody, didn't work for every stage of dementia but actually it wasn't about the stage of dementia, it was about the person. So, if people liked cats, they accepted the cat - it looks like a cat and not too Uncanny. People who didn't like cats, who found cats scary, the people who preferred dogs. I had someone say to me “do you do a budgie?”, “No”. So, you have to pick and choose, it did work sometimes for distraction, say if the person was getting a bit emotional at nighttime, you know, where they were getting a bit distressed at nighttime and you could use it as a bit of distraction. Where they were feeling a bit withdrawn and they felt they couldn't communicate or it was too demanding for them to communicate, was too difficult to communicate, there's no threat with this. You can talk in baby language to it and it's not going to tell you off. There was no threat, so they could communicate really well with it. And I felt that there was, I mean, I would, wouldn't I? Because I'm into spirituality and connection with people so I would obviously think about this, but I do think that there is something about the way we love and cherish our pets. The love they give us back, that companionship, the need to be needed. And one of my participants said “I know that I can look after it and I know it needs me”, not in those exact words, of course because, you know, I'm paraphrasing, but there was something about that need to be needed and often somebody with dementia doesn't have that need to be needed. They're the needy ones, so it gives them a bit of relief from that as well, I think.

So, I want to do more. Where are we going next? I want to do more. I just had an email from the people who distribute these in the UK. I had that email yesterday as a result of this talk, so I'll be getting on the blower to them and saying, okay, send me some more.I want to do some more and this time I want to really look at the connection, the communication networks, that kind of focus. Whereas before, I was on a voyage of discovery, now I want to really focus in on some of those bits of results I've had already that I want to see more about, want to see if there's anything else I've missed. So that's where we are going and if anybody wants to come on the journey with me, I would be more than happy to have friends.

Thank you very much.