

## **Lian Loke – ‘Can Technology Turn Us Into elite Athletes?’**

**Moderator:** Welcome to the podcast series of *Raising the Bar Sydney*. *Raising the Bar* in 2016 saw 20 University of Sydney academics take their research out of the lecture theatre and into 20 bars across Sydney, all on one night.

In this podcast, you will hear Lian Loke’s talk: *Can Technology Turn Us Into Elite Athletes?* Enjoy the talk.

**Lian Loke:** Thank you. Good evening everybody. It’s great to see you here. I’m going to start my talk with the premise that, as humans, we are fundamentally lazy. If we can find ways of doing less work and doing things in less demanding ways, we do, and I think if you look back over history, you’ll notice that in terms of technology and machines, we’ve always found ways of making our lives easier, less arduous, less physically demanding.

I think a really good example of that, when I think about it, is actually the washing machine so ... especially for women. And manual labour back in 1908, the washing ... the electric washing machine was invented. Can you imagine hand-washing bed sheets? I mean wouldn’t that just be terrible? So things like the washing machine have actually helped free us up from various kinds of manual labour and open up different possibilities for what we can do with our, with our lives.

But in the 21<sup>st</sup> century where we are now, which is 100 years later, we’ve come to a point where technology has become has become freed up from using our physical bodies that we’ve hit this crisis in terms of health and wellbeing. So there are various studies that have been done - public health and science studies - that are looking at the impact of the sedentary lifestyles that many of us are leading in the western world. We tend to move less; we tend to sit a lot; we drive around in cars. There are various factors that are converging that are making us actually less physically active in our lives.

And you may not feel the effects now but they’re basically estimating that if you don’t move enough in daily life, that you’re going to have an increased risk of getting all those dreadful diseases like heart attacks, dementia, diabetes and so forth. So I’m interested in how we can actually turn this around, how we can look at ways to find new opportunities, through design and through creative technologies, to make us new more.

So the World Health Organisation actually has a goal, a target set, for 2025, which only a decade away, to reduce global physical inactivity by 10%, so various countries around the world, and health agendas, are looking at how we can actually address this problem, which for a lot of us may not seem to be a problem at the moment. I mean this ... you look like a fairly young crowd in the room. You’re probably quite physically active and maybe not suffering from any of these diseases that come along later in life.

I’ll just get a show of hands though, who did physical exercise today? Ooh, quite a few of you. I just want someone to throw in what they did and where they did it.

**Female Speaker:** Swim at Icebergs.

**Lian Loke:** Swim at Icebergs? Oh, lucky you. That sounds beautiful. Anyone else?

**Male Speaker:** I rode to work.

**Lian Loke:** You rode to work? Okay, cycling, excellent.

**Female Speaker:** Cycling in Centennial Park.

**Lian Loke:** Cycling in Centennial Park? Oh this is all very progressive activities going on. This is great, okay. Did anyone not physically exercise today? Let's out those people. Okay, there's a few of you in the room as well. Why not?

**Female Speaker:** (3:22).

**Male Speaker:** (3:22).

**Lian Loke:** Sick.

**Female Speaker:** Time.

**Lian Loke:** Time. Time poor? Don't like it? Okay. Okay, so a lot of us lead really busy lifestyles, depending on the kind of work we do as well, especially if we're working in offices or in academia, for example. We spend a lot of time on our computers so that's one of the other trends, basically, meaning we're doing a lot less physical activity because we've tended to design for convenience, for immediate gratification, for instant connection, and usually trying to design less physical exertion to actually do things. So I'm interested in the work I do in Design Lab about how we can look at turning that whole trend around.

Okay, so I'm interested in how we can rethink exercise. For some people exercise is a bit of a dirty word. Sometimes we limit ourselves to where we do exercise. So those examples there though are quite ... I guess they're quite tradition forms: cycling, swimming and so forth. Did anyone do any dancing today? Yeah? Someone danced back there? Where did you dance? Whereabouts did you dance?

**Female Speaker:** At the faculty here.

**Lian Loke:** In the faculty?

**Female Speaker:** Yes.

**Lian Loke:** Okay. What's going on? I haven't heard about this.

**Female Speaker:** (4:38) Louie (4:41).

**Lian Loke:** Okay, great. So I'm going to talk about Louie's work a little bit later, so I didn't ... that's great to hear there's a bit of dance happening. So I'm interested too about the different sites that we can design in. So we have home environment, we have the workplace and we have public space and you're probably ... if you think back about how you actually move through those spaces in daily life, you ... there are different kinds of movement patterns that we basically embody every day. Where do you think you're the most physically expressive? Home? Workplace? Public space? Home? Anyone go for home more physically expressive? Oh, a few people over there.

**Female Speaker:** What do you mean by physically expressive?

**Lian Loke:** Oh, like this sort of stuff.

**Female Speaker:** Out there.

**Lian Loke:** Yeah, like more ... yeah, more vibrant, more expressive. So I mean public space is at the one end. Who thinks they're very expressive in a public space? Through, through what kind of behaviour?

**Male Speaker:** Just interacting with a lot of friends and stuff out in public spaces ...

**Lian Loke:** Ah ha, okay.

**Male Speaker:** ... and so like ...

**Lian Loke:** Your gestural interaction tends to be ...?

**Male Speaker:** Yeah (5:44).

**Lian Loke:** Yeah, quite expressive. What about the workplace? Sorry.

**Female Speaker:** Dance.

**Lian Loke:** Oh, dancing in public space? Cool.

**Female Speaker:** (5:51) walk the dog.

**Lian Loke:** Walking the dog, okay. The workplace? Yeah? Okay. So there's a bit of expressive behaviours going on. That's good. Better than I thought. All right, I'd better redesign my talk. So in those three spaces though, there are probably different kinds of opportunities for redesigning how we move in those spaces, depending on the kind of activity you're doing and the kind of social processes at work there.

But I'm going to talk about two tonight, so I'm going to talk about, first of all, this trend of incidental exercise, which is about disguising exercise in everyday activities. And the other one is looking at play and gamification, so more playful, creative approaches to getting us to move more, and more expressively.

In the incidental exercise side, there's been a whole lot of work there around active design guidelines that are now being released and various new buildings are being ... and work environments are being built according to those design guidelines. So I don't know if anyone's in an active designed building, but they do those possibly annoying things like put the, you know, the printer down the other end of the hallway, you don't have any garbage bins at your desk and stuff like that. So it's all these small things they do to make you actually have to walk more in the building, so rather than being stuck at your desk all day, you actually are forced to be more active.

So there's a lot of things around sit/stand desks, getting you out of sitting, standing, having different designated areas for you to do different kinds of work. So you might have a meeting area here, you might have a collaboration space over here, you might have a quiet room over there, and so forth. So there's a lot of this going on at the moment. A lot of big offices and corporations here in Sydney and Melbourne are being redesigned through active design guidelines.

But I just want to throw in a personal story as well. So we just moved house over the last week, and we moved into a new place and obviously, you know, you're unpacking lots of boxes and deciding where you're going to put those ornaments and where you're going to put your crockery and things like that. So my daughter, who's really into tea, she basically put in the main cupboard over the sink ... thought, "I'm going to put all my tea boxes in this cupboard," you know, the prime spot. Great. The Pete, my partner, walked in and he, he did a redesign and so he decided to put them all up in these top cupboards across the thing. So all right, whatever. He doesn't drink tea; she doesn't drink coffee.

And then so what I do every morning though ... my morning ritual is to come downstairs and, you know, get the old Italian stovetop coffee maker and get the coffee out and make my coffee on the stovetop. So this is what I do to sort of wake up. But I was like, "Okay, where's the coffee gone, 'cause it's not in the cupboard where Velvet put it." "Oh, it's in the cupboard somewhere where Pete put it." So Pete's like over six foot tall. Anyway, so I'm there kind of reaching up to that cupboard and I get the coffee out and I go, and I go, "Oh, it's (8:37) annoying. The cupboard is so far out of reach."

And I thought, "Well, no that's actually like ... that's the way you can design a stretch," so there's actually physiotherapists that are now advocating that you actually try and exploit your domestic routines and put in ... make them, you know, exercise-worthy. So I thought, "Well I could design in a little stretch." But the stretch has got to be like just right. So luckily the height of the cupboard was okay, given my size, so that I could just get up on tiptoes and have a little stretch. And I feel good in the morning. I'm feeling good having a stretch.

But design is a bit like *Goldilocks and the Three Bears*, you've got to get it just right, so it can't be too high or too low, and especially in terms of how you use your physical body. We know that you have your personal kinesphere that you can easily reach and move around in. And then you can also reach out ... extend and reach out to space. But if you go too far, you end up sort of straining the body as well, so it's trying to find that sweet spot between convenience by just moving my arm this much, or a little stretch, which might feel good, towards something that might end up being painful and end up with sort of chronic conditions as well. So that whole idea is quite interesting to me.

All right, but interestingly enough, there's, there's things happening in the ... there are trends in the other area where elderly people are realising that they're needing to redesign things like their kitchen and lower the kitchen bench and bring the shelving down because they're shrinking as they get older. So that's like a counter trend to this idea of actually stretching, so bring ... you know, make the house shrink as you shrink.

Okay. So I'm going to talk ... the rest of my talk ... that's sort of setting the scene for these kinds of ... you know, the active design and incidental design, but most of the examples I'm going to talk about now are more in the sort of playful creative role, using things like fun and gamification to actually help us move more and have fun with it.

So in terms of design, for me it's also about very much populating the imagination, so there are many design ideas and concepts that we generate in the lab, and other people do as well through their projects, that don't end up as products, or don't have much of an extended lifespan when you put them in the public arena. But they're very useful for helping us generate ideas, raising awareness and actually helping disrupt the social norms about what is permissible to do with our bodies in different kinds of environments.

So some of the examples that are already out there ... I think ... I'm just going to show you, through examples, that have different kinds of design strategies behind them, or technology applications. So the first one everyone's probably quite familiar with is the Fitbit. How many people here have a Fitbit? What's your highest number of steps? Do you use it to count steps?

**Female Speaker:** Like overall, ever, or generally?

**Lian Loke:** Oh ...

**Female Speaker:** My highest ever was like 35.

**Lian Loke:** Thirty-five steps?

**Female Speaker:** Thirty-five thousand.

**Lian Loke:** Oh, 35,000, okay, that's better. Right okay. Walking very slowly. All right, so some people really take to these kinds of technologies that monitor and quantify what you're doing in daily life. Other people are very adverse to them, so there's a bit of split camps around that. But the Fitbit, I guess, is an example of a persuasive, motivating technology where it monitors your activities in certain ways, it reminds and nudges you to do certain kinds of activities, so if you haven't got your step counts up, it will probably send you a notification and (12:09) gently remind you to actually go and do that thing. So it works for some people and not others.

Another interesting example of using exercise in a reward sense is that when the Olympics were in Russia the ... they set up in the Moscow subway a system where you could do squats and if you did 30 squats, you got a free train ride. So that seemed like a pretty, you know, simple but rewarding way to do it. I don't think ... I think it was a temporary system though.

Other well-known examples of using more playful approaches to converting things like activities we would normally do, like working up stairs. So there's that classic example of the piano staircase, which is in Stockholm. So it was ... there was a set of stairs next to an elevator ... escalator, sorry. So most people in the train station were taking the escalator, of course. So they thought, "How can we actually make people walk up the stairs, make walking up the stairs fun?" So they turned it into a piano through the use of technology and a lot of people had a lot of ... you know, could use it in sort of creative, playful ways to move more.

And of course there's Dance Dance Revolution, that arcade game that was developed in 1998, so it's been around for almost 20 years and I mean it lives in arcades, but it's another example of using these sort of dance pattern routines and gamification and competition to actually get people moving.

Another interesting example I saw more recently that was ... been travelling around at festivals in the back of a truck was this game called Tweetris. So it was ... people at the University of Toronto had developed this combination of Tetris – so the shape-fitting game – with sort of yoga moves and Twitter. So you actually had to like jump in the truck and create different shapes with your body to play the game of Tetris.

So there are tonnes of examples out there, which we can draw inspiration from. A lot of them haven't actually had longevity though in the public arena, for various reasons. But I'm going to now turn to the current ... some current projects that are happening in Design Lab that I'm doing with my students, research students and design students, just to give you a sense of some of the things we're exploring as well.

So one of my students, Louie Shu, who's here tonight, is working on the topic of looking at how we can design for physical activity in public space, and he's decided to look at waiting time, so where do people wait and not do much or are a bit idle in public space? So things like the train station, the bus stop. He's having a look at how we could actually exploit and appropriate that particular setting and what people are doing there and how we could offer some kind of interactive solution that gets people to move.

And what he's done is actually conflated that physical movement with energy generation, so you can power up your iPhone or you can put energy back into the grid by actually playing this gamified interface. So we have a sort of ... payment tiles that turn your movement data ... your movement into electricity, and so he's actually managed to build a working prototype with that. I think it's going to be on display at our end of year design grad show. When's that? November.

**Male Speaker:** Twenty-fourth.

**Lian Loke:** The 24<sup>th</sup> of November in the Faculty of Architecture, Design and Planning. Come along and have a play.

So one of the other projects that I'm currently working on is a whole series where I'm looking at working with more soft and gentle movements, those subtle movements that you might, that you might want to do, say in the workplace, where you might not want to do high exertion activities. And I've currently been collaborating with a Feldenkrais practitioner. I actually go to classes myself because I do have sort of lower back pain.

And it's a bit ... if you haven't heard of Feldenkrais, it's a particular system that has movement through awareness lessons, which basically ... you go to like an hour long class and you usually get to lie on the floor, which is great. And then they take you through all these really small shifts, often that are looking at exploring relationships between your, your pelvis and your chest and your head, and how your body ... how you organise your bodily movement, trying to find more way ... more easeful ways of it functioning.

So it may seem quite simplistic, but you can go to a class and you can do very small things and feel like you're getting quite a workout. Like sometimes you do something for, you know, to minutes, and you really feel like you have to lie down and rest. But the premise of it is, is actually working on rewiring your sensory motor system and by putting new stimuli and blocking old patterns of movements, you actually reprogram your movement potential.

So it's a really interesting system and I'm, I'm very interested in how we can take some of those principles from that movement system into designing interactive technologies. So at the moment it's in development but I've got ... I'm looking at basically the act of sitting - which we do a lot, and you're sitting there right now - and how we can make that more of an active behaviour.

So you're being very good and you're sitting very still right now, but is that just because you were trained to do that when you're listening to someone talking in public? Does anyone feel like fidgeting or moving? Probably. Okay, you can, you can.

So this particular seat that we're building, it's called Let's Sway, and the idea is that you actually move around while you're sitting. But we're working with these Feldenkrais principles where you do lots of small circling movements and figure of eights and that starts to ... you do it from the base of your pelvis, it travels up your spine.

So if you're sitting at a chair right now, you might just want to locate your seat bones, the bony bit of your pelvis that you're actually sitting on. Can you feel those bones in the chair? You can just have a little ... okay, and once you've located those bones, they're actually what you're sitting on so you could start to ... if your feet are flat on the floor right out in front of you, about hip width apart ... very good. And then you can make a little figure of eight, tiny figure of eight between those two seat bones, so you're shifting your weight over them. You can make it quite small. Just let your breathing flow. Don't hold your breath. Is that working? So you can, you can size of the, of the pattern. So you can make it really tiny if you want or you can make it quite large, whatever's comfortable. And just notice what effect that has on the rest of your body.

So the system we're designing is using ... we're using current technologies, ones you can buy off the shelf, and basically hacking them together. So we're using something quite old called the Wii Balance Board and putting that into a custom built seat box and then creating a, a visualisation interface for it. But it's more, more aesthetic in nature. So rather than quantifying the data and showing you graphs of your, you know, of your butt ... how your butt is moving on the seat, your butt on spine, we're showing various kinds of circling figure of eight patterns that will then show the trace of your movement as well. So it's more just kind of soft interplay between the data from what your body's doing and some hopefully sort of invitational kind of visual pattern that will suggest you to move in that way. So the idea is that it might be ... you might have it as part of the interface at your desk, for example, so that you'd be prompted to do this sort of thing.

So we're looking at all kinds of things and maybe then being able to socially or ... you know, with somebody else, you could actually send them your ... I'm going to call this your sway data, your butt data, and vice versa. So you could sort of interact in a very different way with your workmates.

Okay. What I really want to do though with, with all of you, is to take you through a live exploration of another concept. And it's one I thought we'd work with here, which is called ... it's just ... the working title is called Tippy Stools or Tippy Chairs. So what I'm thinking to do, is to try and incorporate something like the squat so - you know, from the Moscow squatting thing - how we could actually put that into something with sitting. So what I'm going to ... maybe I'll borrow ... is there a stool over here? Yeah, okay. Installed.

So what I'm going to do first is just demonstrate the concept and then I'm going to invite you to do it with me, okay? So the idea ... first of all, if we look at the technology, it's a seat, but it actually has sensors in it. You didn't know that, but I've gone around and put sensors in all the seats in, in the wine bar, and it's actually measuring whether you're sitting on the seat. What it also does, which you didn't know about too, is it ... actually it can tip and tilt, so the seat base can move. So the idea again is if you've been sitting down for too long, which ... just say about 30 minutes, which you haven't yet, the seat will actually tip you and you'll have to get up.

But I've actually devised a special way to get down again, okay, which is where the exercise is. But it's again drawing on Feldenkrais principles. The ... Moshé Feldenkrais was actually an engineer and a physicist and he had ... he ended up having a knee injury from playing soccer. This is sort of, you know, around World War II time. And he, he wasn't allowed to move the leg and it was going to get operated on. Anyway, he ended up doing some incredible self-study of body movement and organisation and devised this whole system and managed to do get around his knee injury and regain mobility. But as a good engineer, I guess, he was looking at things like mechanics and levers and stuff like that.

So you'll notice if I ask you ... I'm a bit high on the stool here though. It's better on a normal chair. To get up from the seat ... in fact, why don't you first do ... how do you get up from your seat? If you just do it now, get up from the seat. Okay, and then sit down again. So just noticing what you did with that. So what Moshé would have said is that, "Okay, let's do something. Let's look between our legs." So if you do that, what happens? Watch out for the table in front of you. So what did you notice about your head/tail relationship you did that? So as the head goes down, does your bum go up? Okay, and was it very exerting or ... so it's more like a pendulum sort of going ... and a lever going like that, right? Okay. So if you did that on the chair, you'll notice your bum comes up and then, then you should be able to stand up quite easily by then, lifting up through your legs. Yeah?

So what we're going to do though is do it in reverse. So I'll demonstrate first. So this is, this is on the special Topsy Stool. I'll do it sideways. Okay, so I've just got up and then ... okay, I'm going to sit back down again but ... so I'm going to do it in reverse. So I'm going to tip over and then I'm going to come down halfway and then I'm not allowed to sit on the stool yet, right? So ... and now I'm in a squat and so then we're going to do four bounce squats - or hover squats, whatever these are called - and then you're allowed to sit down again. Okay, so I just inserted a little bit of exercise into the act of sitting down.

But what we're going to do to make it more fun is ... because this is a special piece of technology, when, when I start to do this, the track will come on, the music track that you've specially chosen that you want to do the bounce to. It's going to come on so ... just watch.

*(Music playing.)*

Okay. Thank you. All right, so now you're going to do it with me, all right? So you just need a little bit of space, so make sure that you're not going to whack your head on something. And I've got to say, it is easier on a normal chair. The high stools are a bit high. So you can just pretend that the chair's tipped you up and you're standing up and then you've come back and you want to sit down again but it's, you know, it's a smart chair so it's like ... it's (24:53) the, the seat is actually tilted so you can't sit down properly until you go through this motion, is basically what's going on.

All right, so I'll just do it without the music first. So first of all, we're going to go ... basically, you're going to look between your legs. You can have your legs slightly bent. Then you're going to look up halfway. Seat bones are going towards the chair, hovering. And then we're going to bounce up and down ... like squat bounce, right, four times. And then you can sit down, so you can lower (25:20). Does that feel good?

**Male Speaker:** Yeah.



**Lian Loke:** Yeah, all right. Great, okay. Standing up again. Now we're going to do it with the music 'cause it's even more fun. All right, take it away DJ.

*(Music playing.)*

**Lian Loke:** One and going down between the legs, halfway up, ready? Bounce two, three, four ... ooh, okay. I think we'd better do it again. We didn't get the timing right, did we? Needs a bit of finessing. One more time?

**Female Speaker:** Yeah.

**Lian Loke:** Yeah, okay. It will kick in earlier. All right.

*(Music playing.)*

**Lian Loke:** Okay and down and looking up and ready? Bounce two, three, four. Oh perfect. Ah, cool, all right. All right, so that gives ... gave you a little taste of the, the Tippy Stool. I need a name for it though; I haven't got a good name at the moment. All right, so it's coming to a store near you soon. Put your order in online. All right.

So that's ... those were examples of the sort of design approach that I'm pursuing at the moment, which is really, I guess, a body first approach, so it's walking outwards from the body, looking at how we can, you know, reappropriate some of those ways we move and different kinds of routines and sneakily embed different kinds of exercise or physical activity in the things we do and try and make it a little bit more fun.

So I don't know if you're going to take anything away tonight but whether it's, you know, figure of eight, seat bone dancing or maybe you'll start doing that action, but it's going to be better if you actually have the seat, so just wait for the product, order it after the show.

All right, so ... and the kind of approach we do a lot in the Design Lab is we do make things. We come up with ideas, we make things, we think prototype and then we kind of like ... you know, we test them. So it's a bit of a suck it and see sort of thing, so we try and put it out in the public space, we get people into test, things like that. So it's like, you know, if you've got anything to tell me about this afterwards, please do. Just meet me at the bar and give me your feedback. That would be great.

But in finishing the talk, again, just to stress that I think there's a lot of creative opportunities out there to leverage everyday routines and to create these more playful interactions, which can be quite subtle as well. So they don't have to be spectacular; they can be very subtle. And yeah, the main thing, really, is to get us to feel good about what we do, so if we feel good moving and exercising, it has all these flow-on effects in terms of how we feel and think, our emotions and how we perform in general.

What I'd just like to end on is suggesting that we really need a physical activity feel good index. So there's already a physical activity index, but it basically is just concerned with the level of energy expenditure but you do in performing physical tasks. So if we put in the feel good part of it, I think we're going to get a little bit further down the track of creating, creating different kinds of concepts and products that may actually, not just make us move, but make us feel good while we're moving. Thank you.

**Moderator:** Thank you for listening to the podcast series of *Raising the Bar Sydney*. If you want to hear more *Raising the Bar* talks, head to [raisingthebarsydney.com.au](http://raisingthebarsydney.com.au).

**End of Recording.**