

## In Touch Newsletter

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### **AI Analyses Facial Expressions in Videos to Help Detect Parkinson's** - *By Marta Figueiredo, PhD*

An artificial intelligence (AI) tool was able to distinguish, with great accuracy, Parkinson's patients from healthy peers by analysing short videos of facial expressions – particularly smiles – a small study shows.

The predictive accuracy of the new tool was comparable to that of video analysis that uses motor tasks to detect Parkinson's, pinpointing facial expressions as a potential digital, diagnostic biomarker of the disease.

This type of biomarker could allow remote diagnosis without the need for personal interaction and extensive testing. This would be particularly relevant in situations such as a pandemic, in cases of reduced mobility, or in underdeveloped countries where few neurologists exist but most people have access to a phone with a camera, researchers noted.

The study, [\*Facial expressions can detect Parkinson's disease: preliminary evidence from videos collected online\*](#), was published as a brief communication in the journal *npj Digital Medicine*.

Parkinson's-associated motor symptoms, such as tremors and muscular rigidity, affect facial muscle movements, leading to overall reduced facial expression, also known as facial masking or hypomimia.

An increasing number of studies suggest that reduced facial expressions may be an "...extremely sensitive biomarker for [Parkinson's disease], making it a promising tool for early diagnosis," the researchers wrote.

In addition, facial expression analysis is a non-invasive tool that only requires a webcam or a phone with a camera, in contrast to the expensive, non-scalable, wearable sensors currently used to analyse movements during motor tasks as digital biomarkers of Parkinson's.

Now, a team of researchers at the University of Rochester, New York, showed that analyses of facial micro-expressions using an AI tool can accurately detect Parkinson's.

The study involved the analysis of 1,812 videos, collected online through a [web-based tool \(Park test\)](#), of 604 people (61 with Parkinson's and 543 without the disease). In these videos, participants were asked to make three facial expressions — a smiling, disgusted, and surprised face — each followed by a neutral face.

Participants' mean age was 63.9 years, and most of them were white and living in the U.S. Patients with Parkinson's had been living with a diagnosis of the disease for a mean of 8.4 years.

Changes in muscle movements in each of the three facial expressions were objectively measured and computed in terms of nine action units, or micro-expressions.

In agreement with previous research, the analysis showed that Parkinson's patients had fewer facial muscle movements than people without the disease.

This was particularly significant for three micro-expressions: raising cheeks and pulling the lip corner — typically observed when people smile — and lowering the brows, usually seen when people express a disgusted face.

According to the team, "...the smiling facial expression has the greatest potential in differentiating individuals with and without" Parkinson's, the researchers wrote. The team then used these differences in micro-expressions to train a machine learning tool to distinguish between individuals with and without Parkinson's.

Machine learning is a form of AI that uses algorithms to analyse data, learn from its analyses, and then make a prediction about something.

They found that their AI tool could correctly identify Parkinson's patients based on their facial expressions with an accuracy of 95.6%, which is comparable to the 92 percent prediction accuracy reported for existing state-of-the-art video analysis that relies on limb movements.

"We show that an algorithm's ability to analyse the subtle characteristics of facial expressions, often invisible to a naked eye, adds significant new information to a neurologist," the team wrote.

As such, facial expressions, especially smiling, "...may become a reliable biomarker for [Parkinson's disease] detection," they added.

**Source**

[npj Digital Medicine](#)

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## Amplitude Movements aka BIG

In recent years, the evidence backing the benefits of exercise for Parkinson's has grown rapidly. There have been many types of exercise that has been proven to improve, function and quality of life for those with Parkinson's.

A frequently asked question is, what's the best exercise for Parkinson's? Well, it's not what exercise or activity you choose, but how you do it.

It's all about the amplitude of the movement. Amplitude training is when you focus on making the movement as big and as powerful as you can.

Many people living with Parkinson's have difficulty performing daily tasks. They can't get out of bed as easily as they used to, and often takes multiple attempts. They need to use their hands to help them get out of a chair or they are shuffling when they walk.

Although strength and balance may be an issue, often these can be improved with amplitude training.

When you have Parkinson's, your brain is telling your body that the size, or amplitude needed to perform a movement (like standing up from a chair or getting out of bed) is less than what is actually required.

To explain this concept, it's like when you are driving and there are speed limits. Your brain believes the speed limit is 40 km when everybody else is moving at 60 km. Subsequently, it often takes multiple attempts to do the intended movement – and as a result is also more fatiguing.

Now, if you were driving on a highway and are consistently being passed you would get the hint and put your foot on the accelerator to keep up with all the other cars.

With amplitude training, the therapist or trainer you work with helps to be that guide and show you how BIG your movements actually need to be in order to complete those tasks that are most difficult.

Studies have shown that exercises or activities that focused on the amplitude of movement can benefit people living with Parkinson's. This then leads to improved quality of life and independence with mobility.

There are many therapists that are trained in amplitude training and many specifically for those with Parkinson's

Amplitude training and reinforcing BIG movements can not only improve the ability to perform daily tasks better, with less fatigue, but other areas including balance and speed of walking improve as well.

So get moving BIG! Your body will thank you.

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## **Proper footwear beneficial in Parkinson's**

One of the most debilitating effects of Parkinson's disease is the loss of coordination and control in body movements, which in many cases leads to severe walking

disabilities. Certain types of shoes can make a difference for those who struggle with walking, balance, gait, or postural instability.

A 2013 study found that textured insoles can improve posture and reduce sideways swaying in Parkinson's patients.

Researchers concluded that, "Such textured insoles may provide a low-cost means of improving postural stability in high-risk groups, such as people with Parkinson's, which may act as an important intervention to prevent falls."

The use of textured insoles was supported by a review published in the Journal of Personalized Medicine of eight other studies involving Parkinson's patients treated with some type of insole or footwear – including textured insoles, footwear modifications, and habitual footwear.

Data collected during the review led authors to conclude that, "There are indications to suggest that textured insoles have positive effects on gait parameters, balance, and plantar sensation in Parkinson's disease patients." However, further studies are needed.

Shoes can also be modified specifically for those with foot, balance, or walking problems. In 2020 a partnership was established between the shoe company Kizik and the Parkinson's Foundation to make hands-free shoes more widely available to Parkinson's patients.

Kizik makes hands-free shoes, which allow people to slip their feet into them without bending over and potentially losing their balance. The shoes also have thick foam on the inside for extra support and comfort.

For people with Parkinson's who experience freezing episodes, laser shoes developed by Dutch researchers may be helpful. Lasers added to the tops of shoes project lines on the floor that provide patients with the visual cues they need. This can help to reduce instances of a person freezing in place as they're walking.

Additionally, a study published in the International Journal of Medical Sciences found that people with Parkinson's are at a higher risk for foot deformities and often wear inadequate footwear, which can diminish their quality of life.

Since balance, gait, walking, and even foot deformity issues are commonly associated with Parkinson's, it's important to select the proper footwear. We also recommend adding a podiatrist to your healthcare team.

### **Sources**

Parkinson's News Today

Journal of Personalised Medicine

International Journal of Medical Sciences

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## **My World Parkinson's Congress**

*Parkinson's Specialist Nurses share their experiences at this global event – this year held in Barcelona.*

### **Lauren Hogan**

Southern NSW Local Health District  
Based in Goulburn

“This was my first World Parkinson's Congress, having started in my current role just over 12 months ago. I felt so humbled to be representing Australia and Parkinson's NSW at this major event. I have not experienced anything of this scale in my nursing career, nor previously been given the opportunity to be involved in such a worthy experience.

“It was such an emotional and raw experience when people living with Parkinson's were able to share their experiences on such a platform. I felt so privileged to hear different perspectives of how people from around the world manage their challenges.

“The experience also took us as nurses outside the frame of practical, day-to-day care for our patients and gave us some perspective. We had the opportunity to hear from the world's best health professionals how we can provide better care, and what is happening in the research field which informs our work.

“For me, the main take away was: ‘We've got this’. I feel as though what we are doing as specialist nurses for our patients is providing them with the right support and resources backed by the latest research. It gives hope for everyone in this field.”

### **Vince Carroll**

Mid North Coast Local Health District  
Based in Coffs Harbour

“This was my third World Parkinson's Congress. The experience was as good as ever, with so many people from around the world sharing information, knowledge, and themselves. The Congress is unique because over half of the attendees are people living with Parkinson's and caregivers.

“The Congress is up there as one of the best opportunities to reflect on your own knowledge, share information and rub shoulders with people living with Parkinson's, researchers, and clinicians from around the world.

“It was also good to some of our local Parkinson's patients and their family members come to Barcelona and be involved in the congress.

“My main take-away from the experience was that we are all in this together. We have the best in researchers and clinicians in the world working together to find a breakthrough in the treatment of Parkinson's disease. It feels this breakthrough is just around the corner!

“We are very fortunate in Australia to have some of the best Movement Disorder Specialists in the world. Our standard of care is world class however we need to make it accessible to everyone in rural and regional Australia”.

**Jody Lloyd**

Mid North Coast Local Health District

Based in Coffs Harbour

“This was my first Congress. I was humbled by the experience of sitting in lectures side-by-side with people living with Parkinson’s – learning about all aspects of Parkinsons – and how involved they and caregivers were in the conference. I personally don’t know of any other conferences where the patient is seated with clinicians and researchers.

“The Congress was a massive event. I was surprised at how many lectures I was not able to get to and found it frustrating at times, having to pick which subject I would attend. However I made sure I attended the lectures which touched on the issues which people living with Parkinson’s are regularly discussing with me in clinic.

“Now I am home again, I will be sharing all the great research I found. The experience also gave me confidence that we already offer a great service to our patients locally. Also, it was nice to have it reiterated that we are offering up-to-date information to the patients accessing our service.”

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***Partnering Through Parkinson’s***  
**Stephen and Laurine Croasdale**

Stephen and Laurine Croasdale met in Paris in 1980, in an Alliance Francaise class.

“I was in class when the teacher announced there was another ‘le petit kangourou’,” recalls Laurine, now 66. “Another little kangaroo.”

“He took me over to sit with her,” recalls Stephen. “I’m not sure she was that impressed with my Amco jeans and flannelette shirt and desert boots! I was travelling around Europe and meant to meet up with friends in Greece by the end of the year.”

“My father transferred from Perth to Paris for his work,” says Laurine. “He suggested I move to Paris.”

Stephen’s friends ended up heading to Greece on their own as Stephen and Laurine’s relationship developed.

“I think Laurine’s parents took pity on me,” says Stephen. “We ended up spending nearly three years in Paris and we married in London.”

On their return to Australia they moved to Sydney, renting in Neutral Bay and Mosman while Stephen worked as a chef and Laurine freelanced in publishing.

“Our son was born in 1990 and then our daughter 18 months later,” says Laurine. “We needed a bigger place and so we bought our house in Forestville. We love it here.”

From 1996 Stephen had taken on teaching at TAFE, full-time for many years and eventually part-time. By 2015 he was struggling a little with tiredness and a croaky voice.

“I’d always liked to be fit and do things like swimming,” says Stephen. “But I started to find I had all kinds of symptoms. I lost my sense of smell I but I assumed that was from when I had the flu. I was investigated for prostate issues. I had ringing in my ears, aches and pains, a frozen shoulder. I had a stress test done with a heart scan.”

“When we were out walking up a hill one day I turned around and Stephen was stooped over and taking very short steps,” says Laurine. “A while later his arm seemed frozen on his left side. A friend noticed he had a tremor in his left hand.”

“Last year after seeing the doctor I left with a referral to a neurologist,” says Stephen. “Although my doctor had told me not to worry, I looked at the referral and saw ‘possible Parkinson’s’. It was World Parkinson’s Day, and on the radio driving home John Watkins (former deputy premier of NSW) talking about his experience with Parkinson’s. My only impression of Parkinson’s was Muhammad Ali bloated and faltering on his fiftieth birthday. As soon as I got home, I googled the symptoms.

“It was quite confronting when I got to see the neurologist. I asked him what I could do and he said there was no cure, it was just going to get worse. I kind of appreciated his honesty, but straight away I was thinking what would happen with Laurine and the kids?

Driving home I had a lot of uncertainty; all those assumptions, all our plans, where was it going to go now? But straight away Laurine sprang into action. She found Parkinson’s NSW and their specialist nurses and we were able to get a lot more information.”

“It was a bit of a process for me,” says Laurine. “It takes a while to absorb; what can we do to make this the best it can be? And eventually the realisation that I don’t have to sort it all out in two weeks. We joined the Support Groups. There was a counsellor there we could speak to, as well as meeting other people with Parkinson’s.”

Stephen was encouraged to join a choir group to help his voice, see a speech pathologist and to become physically active again.

“I was struggling with apathy,” he says. “But joining the Step Up for Parkinson’s (an activity-based fundraising campaign) was important because I set myself goals. Committing to exercising 31 days in a row was a big challenge, but I did it.

“Since then I’ve continued to set goals. It might be just working in the garden. I can’t do things the way I used to, but it gets done. I’ve done more fitness training, with things like PD Warrior. A year and a half after my diagnosis I’m actually fitter than I was.

“That doesn’t mean I don’t have bad days. Managing my Parkinson’s is pretty much a full-time job. Although I am going to volunteer giving cooking lessons to men at the Men’s Kitchen.”

Laurine says Stephen puts as much effort into managing his Parkinson’s for his family as he does for himself.

“He’s very motivated,” she says. “I don’t see myself as his carer. I do things for myself, too. Last year I signed up to become a guide with the Art Gallery of NSW; I love that. I take my mum out for a day once a week. I go walking with friends and then we have a coffee together. I also volunteer with the Australian Children’s Laureate Foundation which promotes encouraging children to read.”

Stephen and Laurine are still making plans for the future: there is debate as to whether they should downsize to a more manageable house, but there is also discussion about visiting their son who lives in New York, and Laurine’s 92-year-old aunt in the UK.

“We are just getting on with our life,” says Laurine. “My advice for others with a new diagnosis is to take heart. It’s overwhelming at first, but there is a community there with support and empathy and advice and information. Parkinson’s NSW is hugely helpful and supportive.”

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## **My (Parkinson’s) Life - Mark Chlad**

Mark Chlad, 52, was born in Luton in England. He visited Australia for work several times before moving to Sydney with his then-wife, an Australian he met in London.

“I really liked Australia,” says Mark. “When I met an Australian girl, I had the opportunity to live in Sydney. We moved here in 2010 when she was pregnant with our first child.”

But while marriage, babies and moving to Australia were all life-changing events in Mark’s life, he had already faced one of the most unexpected challenges at just 30.

“One evening while I was out running in London my left foot began curling in on itself,” he recalls. “I stopped, and then put it down to using new trainers. Then other strange things started happening. My left arm went into a ‘sling’ position in the shower, but there was no sling. I went out with a mate and while we were having a few beers my pinkie finger started jumping around and I couldn’t make it stop.

“I had no idea what it was and went to an osteopath, and then a haematologist, thinking it was a problem with my bones or blood. I’d done a degree in chemistry,



and I had quite a bit of medical knowledge, but I didn't go searching online myself. I waited to be diagnosed and eventually had a DaTscan (dopamine transporter scan).

"I got the Parkinson's diagnosis two weeks after my thirtieth birthday. I'd had a huge party at a great nightclub. Everything crashed around me, and it was really scary. I didn't tell anyone except my sister at first; I didn't tell my parents for three months. I was the loneliest I've ever felt in my life."

Mark worked in the fast-paced world of pharmaceutical marketing, work which developed into managing the building of huge exhibition stands for pharmaceutical conferences around the world.

"I worked really hard and was flying around the world to set things up," he says. "I'd had opportunities to work in all aspects of the business and was able to continue working. When I met my then-wife in 2008, I told her about my condition a couple of weeks into the relationship. We married but once we were expecting our first child it seemed like the right time to move to Australia.

"Unfortunately, it was then at the tail-end of the global financial crisis in Australia. It was terribly hard for me to get work. My wife already had work lined up, but I really struggled.

"I had to go to interviews and while I hadn't developed the shakes, I did have problems with rigidity. I looked pretty normal, but my gait was impaired, and I stumbled quite easily on some surfaces. I had a wide range of skills and experience, but it slowly became a very dark time.

"Things became really difficult. My wife was working, and I was hallucinating terribly at night so sleep was really disrupted. The drugs I was taking made me think what I was experiencing was normal, but it was actually crazy hallucinations."

Mark's marriage ultimately didn't survive the challenges of Parkinson's. While the couple separated, he and his ex-wife have both focussed on their daughter's best interests and Mark remains a very involved father.

By 2012 Mark had decided he was ready to have Deep Brain Stimulation and was eligible for the surgery.

"I was having trouble controlling my Parkinson's with the available drugs," says Mark.

The DBS gave him an opportunity to rebuild his life and he created a business producing PowerPoint presentations for clients.

"That went all right for a while, but I never stopped wanting to write," he explains. "I'd had the opportunity to write material for the pharmaceutical companies I'd worked with in the UK because I had a science-based degree, and I'd enjoyed that."

On New Year's Eve 2019 Mark began to write about his own experiences. The ensuing pandemic provided plenty of writing time, and he published two books:

*Drivin' Daughters and Parkinson's* and *The Time Thief*, under the nom-de-plume Marco Preshevski.

*Drivin' Daughters* looks at how Parkinson's crept into Mark's life and how he had to make so many allowances for it.

"It's really all about how I fit it into my life, not the other way around," he says. *The Time Thief* is more about the challenges facing me as a younger-onset Parkinson's person, so it talks more about work and goal setting and achieving. I've been told that both are excellent stories, and yes, all those things did happen.

"I'd like to get back into advertising and marketing now. I'd like to be able to use the skills I have. I'm also writing a third book."

Mark exercises regularly and does push-ups, so is entering the Push-up Challenge in June to fundraise for mental health.

"I'm doing 130 to 150 each day at present," he says. "Exercise is very important for Parkinson's as well as for mental health, but I get annoyed when I hear people claiming it's cured their Parkinson's. The Parkinson's has just stabilised, it hasn't gone away."

Mark is still managing on his own and has not signed up to the NDIS for support.

"I speak to one of the Parkinson's nurses from time to time for support and advice," he says. "But it can be quite lonely, it's terribly difficult to meet people, especially as I have moved from my old friends in the UK.

"Most people my age are busy with work and family at this stage of their lives. But I'm happy that I have a beautiful daughter."

*Drivin' Daughters and Parkinson's* and *The Time Thief* by Marco Preshevski can be ordered through Booktopia and Amazon, or through all good bookshops.

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## **World Parkinson Congress Video Competition Winners**

A video competition featuring productions by and for people living with Parkinson's is a much-anticipated part of the World Parkinson Congress.

This year's Congress was held in Barcelona, Spain, and the most recent video competition features entries from around the globe – including Australia.

The featured videos are quick and easy to watch. They would make good content for a future Parkinson's Support Group meeting.

Just click [here](#) to view the top 12 video finalists and Honorary Mentions.