

Seeing the world through the eyes of an Orangutan

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She is a captive bred Sumatran orangutan. He is a neuroscientist specialising in cognitive and sensory systems research. With the help of specially adapted eye tracking equipment they are hoping to explain some of the mysteries of the visual brain and improve the lives of captive bred animals.

Dr Neil Mennie, from The University of Nottingham Malaysia Campus (UNMC), has received funding from Ministry of Science and Technology and Innovation, Malaysia (MOSTI) to study the [eye movements](#) of Tsunami—a seven year old [orangutan](#) at The [National Zoo](#) of Malaysia (Zoo Negara). Not only will Dr Mennie's research address vital questions about the [visual cognition](#) of humans and apes in natural tasks, it will also provide valuable enrichment for the juvenile captive-born orangutan.

Dr Mennie said: "Orangutans are particularly interesting because to survive in the treetops they must be very spatially aware of their surroundings. I hope to investigate their ability to search for food and to compare their progress with humans in 3D search and foraging tasks.

Dr Mennie, who is from the Cognitive and Sensory Systems Research Group in the School of Psychology at UNMC, is interested in how humans and apes use their brains to learn and make predictions about our surroundings. With the help of Tsunami's keeper, Mohd Sharullizam Ramli, and the special eye tracking equipment that is worn over her head and shoulders, Dr Mennie has spent the last year recording Tsunami's eye and body movements during the performance of complex actions such as locomotion, foraging for food and manipulation of small objects.

Tracking the eyes of an Orangutan

Tsunami was slowly introduced to the idea of wearing the [eye tracking](#) equipment that consists of a back pack containing a [wireless transmitter](#). This pack back transmits data from two video cameras mounted on her head-band. As Tsunami performs various natural tasks—foraging for food, using tools, moving around—one camera films what she sees and the other camera films the movements of her right eye. Afterwards Dr Mennie and his students sit down and look at each video frame from this camera and write down the timing and location of these eye movements over the environment. As we make 3 eye movements per second, this is a very time consuming procedure.

Dr Mennie said: "I'm interested in the way we make predictive eye movements to places in the world where the stimulus is yet to appear and whether these predictive eye movements are there to assist the timing and placement of actions or whether they also help high-level mechanisms such as memory for our immediate space and the location of objects within it."

As part of his research Dr Mennie is also hoping to shed light on how these endangered animals navigate to help other scientists who seek to conserve the orangutan habitat. Knowledge of their foraging and search behaviour may help in the design and conservation of forest corridors.

Improving the life of captive animals

Orangutans are a critically endangered species—they are also among the most intelligent primates. The Sumatran orangutan is on the IUCN Critically Endangered list. At Zoo Negara they are hoping Dr Mennie's research will help them develop their Enrichment Programme that is designed to get captive animals behaving as they would in the wild.

In the wild Tsunami would use her vision and her hands to guide her through the environment—to find food, to use tools, to move and climb. To make Dr Mennie's task even harder, orangutans can grasp equally well with their feet. Faradilla Ain Roselan, Zoology Officer at Zoo Negara Enrichment Centre, said: "We want to keep our animals occupied so they don't display stereo typical behaviour such as pacing. We also want them to be able to exhibit any natural behaviour. Apes are highly intelligent animals and we don't want them to get bored. If we predict what they want to do maybe we can think of an enrichment that would suit their intelligence."

Long term goals

Currently Tsunami is in a specially built enclosure and this is proving to be a very useful beginning. Eventually he hopes to track this young orangutan when she is allowed to join her fellow red apes and Dr Mennie's long term goal is to record animals in the wild.

Dr Mennie said: "I could have done this research at any zoo. But the

orangutan is a flagship symbol of Malaysia and I think it is fitting that this research is done here in Malaysia at The University of Nottingham Malaysia Campus."

Provided by University of Nottingham

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