

THOUGHTFUL GESTURES

New King's Junior Research Fellow Marwa Mahmoud is teaching computers how to decode facial expressions – in humans and in sheep.



Three months into her JRF and computer scientist Marwa Mahmoud is relling in the interdisciplinary atmosphere at King's.

"At High Table you can talk to psychologists, anthropologists, classicists. So it really broadens your thinking," she says. "Aside from the social aspect, it's really useful for my field because there's high potential for collaboration down the line."

That field is affective computing and social signal processing – in other words teaching computers to recognise human emotions. In recent years, computers have become able to identify parts of the face, such as the eyes or the mouth, and to map changes or movements in them to certain emotions.

For her PhD, Marwa took the idea one step further by exploring how a computer might interpret gestures in the non-verbal expression of emotions. Specifically, she integrated the touching of the face with the hands into the research.

"That's a hard technical problem because the hands and face are the same colour and texture. But we created a system that detects when the hand occludes the face and whether it's static or moving, hands open or closed."

"Such gestures have lots of applications – in children's emotions, for example. A study of curiosity and problem solving in children discovered they touch their faces a lot so it's one of the cues that's interesting."

Marwa is currently working on a Jaguar-Land-Rover-funded project to train computers to detect drowsiness or other mental states such as distraction and confusion in a driver's face. Next year, she will begin to apply similar concepts of automatic detection of non-verbal signals to the medical field.

"It has lots of applications, especially in mental health," she says. "I don't think a computer will replace a psychiatrist, but we can create tools that will give psychiatrists or experimental psychologists quantitative measures of non-verbal signals that can help as part of a diagnosis."

And as a side project, Marwa is interested in the facial expressions of sheep – which vets often use for pain detection.

"It turns out there are cues," she says. "When a sheep is in pain, the most important part is the ears, but the eyes and the nostrils also change shape."

WELCOME TO OUR OTHER NEW FELLOWS!

Alice Blackhurst, JRF, French & Visual Arts, who is researching the use of clothing in contemporary art projects.

Aline Guillermet, JRF, Art History & Theory, who is investigating the ways in which digital visual culture has impacted upon painting practices since the 1980s.

Caroline Van Eck, Professorial Fellow, History of Art, who was featured in the summer 2016 issue of *King's Parade* – available for download from the King's website.

Oscar Randa-Williams, Fellow, Mathematics, whose research interests are in algebraic and geometric topology, most recently in high-dimensional manifolds and their automorphisms and in positive scalar curvature metrics.

Mark Gross, Professorial Fellow, Pure Mathematics, whose research is in

algebraic geometry, in particular a new area heavily influenced by string theory.

Gareth Austin, Professorial Fellow, Economic History, who has worked at a range of institutions, including the University of Ghana, the LSE and the Graduate Institute of International and Development Studies in Geneva.

John Arnold, Professorial Fellow, Medieval History, whose research mostly focuses on ordinary medieval people, and who is working on a study of local religion in southern France, before the Black Death.

Laura Davies, Fellow, English, whose research focuses on the relationship between sensory experience and its textual representation in British literature of the eighteenth century, and who is working on a book about dreams and dreaming before Freud.

Goylette Chami, JRF, Medical Sciences, who will theoretically and experimentally examine how best to establish social network interventions to increase the distribution of and compliance with mass treatment.

BYE-FELLOWS

John Filling, Bye-Fellow, Philosophy, who works on political philosophy and the history of philosophy, and is writing a monograph on the concept of domination.

Charlotte Summers, Bye-Fellow, Physiology, whose research aims to define the role of neutrophil-endothelial cell interactions in regulating pulmonary inflammation.

Charis Olszok, Bye-Fellow, Asian & Middle Eastern Studies, who is examining the depiction of animals in modern Libyan fiction and broader Arabic fiction.