

Using Hollywood technology to unlock the secret of pianist's sounds

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University of Southampton academics are pioneering a new way of using motion capture technology to examine the way pianists play the piano.

By using a unique kinematic [measurement technique](#), known as [HAWK](#) (Hand And Wrist [Kinematics](#)), researchers will be able to look at individual pianists' playing technique - giving an insight into the [posture](#) of their hands on the keys and the movements they use - hopefully showing how this translates into the unique sound they create.

The research will also provide new information on [musicians'](#) hand

health, to combat wrist injury (for example, repetitive strain injury - a common problem for pianists).

The project is being led by world-renowned pianist and University of Southampton Music Professor David Owen Norris and Health Sciences academic Dr. Cheryl Metcalf. By using a state-of-the-art [motion capture](#) laboratory, equipped with recording technology and Vicon cameras - the same sort of technology used in Hollywood films for special effects – Professor Owen Norris will be able to track pianists hand movements using the motion capture cameras.

Dr. Cheryl Metcalf, who designed, developed and validated the [HAWK](#) validation technique, says: “Human [hand function](#) is fascinating when you think of the variety of tasks we perform every day. However measuring human hand function is complex given the many different ways we can complete a task. Creativity is fundamental to hand function and to self-expression. HAWK analysis will enable us to understand the biomechanics of how musicians achieve their unique expressions.”

Professor David Owen Norris says: “It’s fascinating to watch pianists’ hands. Audiences always want to see exactly what’s going on with those flashing fingers, and pianists look at hands too; we argue about the best ways to make certain sounds and we compare what different players do with their fingers and their wrists.

“When I saw how Cheryl’s system can analyse exactly what we’re doing with our hands, I realised that together we could find the answers to some fundamental questions by making an archive of piano-playing. Pianists could appear in a dual archive of recordings and HAWK films - we could hear the sounds they make, and we could see exactly how they make them. Our hope is that in just a few years this unique archive would acquire an international standing.”

Professor Owen Norris and Dr Metcalf are trialling this technique for the University's Multidisciplinary Research Week, a programme of activities from 6 to 10 February that showcase different aspects of multidisciplinary work at the University of Southampton. The resulting film and analysis will be presented during this week 'in concert' at the Turner Sims, on the University's Highfield Campus, on Monday 6 February.

They hope they can develop the research further to build an archive of pianists playing techniques, from music students to visiting concert pianists, with the hope of establishing how technique affects sound and advise on how to avoid injury.

Provided by University of Southampton

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