Smart uses of mobile phone power

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For the first time smart phones and tablet PCs could be used by police officers to help solve crimes faster and more cheaply.

Dr. Mohamed Gaber, of the University of Portsmouth's School of Computing, told an international conference that combining the power and wireless facilities of smart phones to collect and process information quickly, rather than relying on centralized computers, could revolutionize crime fighting, mobile healthcare and live business intelligence.

His research has been hailed as outstanding by experts and could pave the way for the first mobile tool for collecting and streaming large amounts of information over the internet.

The combined processing power of mobile phones could also be used to monitor people's health more quickly and more cheaply than existing methods allow.
Dr. Gaber said: "This is the first time a method has been found to stream information collected from smart phones working together.

"Imagine police officers equipped with smart phones that can capture all the sensory information in a crime scene such as fingerprints and digital images– all the data could be analysed locally and the results could be fused together in real-time to give them some insights and knowledge.

"We have discovered that we can get excellent results with as few as eight mobile phones being used together where each phone handles a

maximum of 40 per cent of the all the possible measurements.

“It is the combination of the power and the acquired data on each device that would make the difference. In fact, one smart phone can do the whole process if it has all the features of the data. However, it is more realistic to assume that each individual can see only part of the picture and collectively we can see the whole picture.”

The processing power of smart phones could also be used in mobile health care.

Dr. Gaber said: “Different mobile devices that measure different physiological signs and symptoms such as ECG, blood pressure and body temperature could be fused together to assess the patient. This could help elderly people and those with chronic diseases to travel and go shopping without being worried.

“Also, patients could use their mobile phones anytime anywhere to monitor their condition and automatically have messages sent through their phone to the emergency department or the doctor if the patient’s condition is getting critical and requires immediate treatment.”

The mobile phone data streaming process does not interfere with the phones’ normal use and calls can be made and SMS texts sent and read – the owner just has to agree to allow their phone’s processing power to be used in the background.

Dr. Gaber said: “Such a collaborative process allows for many things. In a neighbourhood, for example, we can share data collected using our smart phones in order to make better decisions about local transport or rubbish collection. In this way being collaborative helps us in taking collective decisions.”

One of the key differences between using mobile streaming data mining as opposed to sending all the information back to a centralised computer to process is the information can be ultra-localized and the speed of processing can be faster and significantly cheaper.

Dr. Gaber has his research presented at an international conference on 'Tools with Artificial Intelligence'. He was told by experts that the research was outstanding and the most effective and best pieces of research presented. He and colleagues Dr. Frederic Stahl and Professor Max Bramer have now been invited to submit it to a special issue of the *Journal of Computer and System Sciences*.

Provided by University of Portsmouth