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## Machine learning in KINECT image processing for biometric and medical applications

The rapid development of machine learning methods opened the door to a new class of fast and reliable identity management solutions and forever changed the research landscape. One of the applications where benefits of using machine learning methods are on the full display is in image and video processing. This invited lecture will discuss recent trends, state-of-the-art methods and applications of machine learning in security and medicine. The traditional definition of biometric security research is recognizing someone's identity from collected biometric data, which includes physiological, behavioral, soft, or social traits. Physiological features can be often collected visually (facial image, ear, iris etc.) or through some specialized devices, such as infrared sensors, remote temperature measuring devices, and so on. Behavioral characteristic includes the way a person walks (gait), the way person talks (voice), the way person writes (typing patterns, keystroke pressure) etc. Soft biometrics include easily collected but not so unique data, i.e. age, gender, height, weight etc. The area where the development of new technologies can have a very tangible effect on society is security and medicine. It is generating a lot of interest and getting traction in biometric research, as well as in related fields looking into human interaction, physiological studies, user profiling, pattern recognition, authorship identification and collective intelligence. This lecture outlines one of the first studies that looks at integrating Kinect sensor image and video processing based on a human gait with activity and emotion recognition. Applications and impact on patient physiotherapy rehabilitation through continuous progress tracking and visual data analytics are also discussed.

### Biography

Marina L Gavrilova is a Professor in the Department of Computer Science, University of Calgary, a Head of the Biometric Technologies Laboratory and a Board Member of ISPIA. Her publications include over 300 journal and conference papers, edited special issues, books and book chapters in the areas of image processing, machine learning, biometric and online security. She has founded an international conference series with LNCS/IEEE, co-chaired several top international conferences, and is Founding Editor-in-Chief of LNCS Transactions on Computational Science Journal. She is on the Editorial Boards of the Visual Computer, International Journal of Biometrics, and six other journals. She has given over 50 invited lectures and tutorials at major scientific gatherings and industry research centers, including Stanford University, SERIAS Center at Purdue University, Microsoft Research USA, Oxford University UK, Samsung Research South Korea, and others. She has several awards, professional designations and media appearances.

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