

Security in Big Data of Medical Records



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Abstract:

This research talk presents some of our results obtained in our efforts to protect the transmission of and access to the patient medical records. The algorithms developed in our group will be applied to medical records consisting of images, texts and voice files.

In our earlier work on Mobile Health Information Systems and Services (MHISS) we have developed a Tele Nurse for intelligent Emergency Medicine usage in rural areas and COW (Care on Wheels) for rural diagnostics, monitoring and testing of high blood pressure, kidney dialysis, gynecological care and monitoring as well as establishing the first pediatric dossiers of the children for their vaccination and inoculation records. All this requires secure medical data transmission and sharing over distance and on line.

This work presents a new method that combines image cryptography, data hiding and Steganography technique for de- noised and safe image transmission purpose. In This method we encrypt the original image with stream cipher algorithm then embed the encrypted image with patient information by using lossless data embedding technique with data hiding key after that for more security. We apply steganography in embedded image with the private key. In receiver side when the message is arrived then we apply the inverse methods in reverse order to get the original image and patient information and to remove noise we extract the image before the decryption of message. We have applied and showed the results of our method to medical images.

Keywords: Big Data, Emergency Medicine, Mobile Health Information System

Biography:

Dr. Ünal is a Fulbright Scholar, a prize winning educator and an engineer interested in big data generated in manufacturing systems and services, health systems and services and on line interactive learning systems and services. She holds patents in the areas of Global Knowledge Networks, Global Supply Chains, Secure Instant Communication and Collaboration Software Platforms and New on Line Auction Models.

She has initiated and established the practice of a design tradition of recyclability, reducibility, reusability and reliability, in short for sustainability, during her tenure as the global director of manufacturing at Lsi Logic of Silicon Valley with 44 global multi sites and with Flextronics with 72 global multi sites where

she was responsible of multi- billion dollar supply chains of design and manufacturing of electro-mechanical and optical systems as well as medical devices. She was instrumental in establishing Flextronics University where continuous certification of the manufacturing engineers in process design for manufacturability with total quality was established for the first time. She has coined the ***Keiretsu and Keiteiretsu*** in global manufacturing process chains where collaboration with the competition can reduce the cost of innovation which in turn can lead to open innovation.

She has developed the Stanford University's Acoustics Program, Penn State University's Intelligent Manufacturing Program and was the first woman chairperson at Clemson University.

She defines engineering education as "***whatever it takes to move from design to enterprise.***"

She is a strong supporter of the belief that the power of business and enterprise can be used to create a more socially and environmentally sustainable world.

Innovation and Open Innovation are the new mechanisms that she advocates for a ***Passage from Design to Product - to - Enterprise.***

Her teaching philosophy is summarized by:

"C S Lewis says we meet no ordinary people; and we say we meet no ordinary students."