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Development Environment For The Certification Of Trustworthy Mobile Medical Applications

Mobile medical applications range from simple physiological monitoring to more complex actuation control such as infusion pumps, and often share data with other apps and/or communicate with healthcare data banks. While this allows an unsupervised patient to be continuously monitored, software errors can be life threatening. Additionally, the secure transmission of data is essential, not only for patient confidentiality, but also safety as a data breach could result in erroneous diagnosis and treatment. Coding techniques for medical apps are primarily manual and lack a credible benchmark for safety and security. Currently, no formal certification exists for medical apps, so there is an eminent need to objectively standardize app-trustworthiness within the industry.

Researchers at ASU have established a framework for the development and certification of mobile medical applications to ensure they are safe for patients and secure from hackers. Using ASU-created Health-Dev, an integrated development environment for designing trustworthy medical apps with secure data exchange infrastructure, a developer can design, create, and test medical apps against a credible benchmark that ensures the code will be devoid of terminal software errors and operate through secure transmission channels. Health-Dev can also be enhanced with new security protocols and additional tools for testing patient safety as needed. The framework includes a mobile data manager that encrypts communication based on a patient's physiological signals, and maintains a secure transmission channel through which medical apps can safely share patient data and communicate with the cloud. There is also an integrated tool that generates reports from Health-Dev's multiple analyses, detailing outstanding requirements or validation of the code to be reviewed by the developer or expert personnel of a regulatory agency. This provides sensible industry certification standards through which a trustworthy medical app marketplace can be populated.

Potential Applications

- End-To-End Security
- Medical App Certification, Testing, & Development
- Mobile Health Systems
- Trustworthy Medical App Marketplace

Benefits and Advantages

- Certifiable – Sets industry standard for patient privacy and protection.
- Effective – Provides early feedback to help eliminate faulty app design.
- Expansible – Can adapt to regulatory policy changes and safety and security innovations as needed.
- Guaranteed – Benchmark code ensures apps will be medically safe and that

any form of data communication or storage is private.

- Safety – Checks for bugs in the software and accounts for random interferences that could cause a patient’s medical device to malfunction.
- Security – Offers transparent and lifelong data privacy management through physiology based encryption.

For more information about the inventor(s) and their research, please see

Dr. Sandeep Gupta's directory webpage