Treat me well: Affective and physiological feedback for wheelchair users

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Abstract:
This work reports a electrocardiograph and skin conductivity hardware architecture, based on E-textile electrodes, attached to a wheelchair for affective and physiological computing. Appropriate conditioning circuits and a microcontroller platform that performs acquisition, primary processing, and communication using Bluetooth were designed and implemented. To increase the accuracy and repeatability of the skin conductivity measuring channel, force measurement sensors were attached to the system certifying measuring contact force on the electrode level. Advanced processing including R-wave peak detector, adaptive filtering and autonomic nervous system analysis based on wavelets transform was designed and implemented on a server. A central design of affective recognition and biofeedback system is described.

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Contents

I. Introduction

Mrs. Alda (fictitious name) is an old age woman with elegant body posture and clothes. Age traces in her clear pink skin are faded by brilliance of her blue tiny eyes remembering the many grannies who with goodness and wisdom reflected in the hands and body movements, gathered around the warm cakes and fascinating stories, the grandchildren, the family, the community. She is an 88 years old lady invited to a Nursing Workshop to speak about her experience on retirement residence where she has been living for the past 5 years. She says that she feels well mainly when she can receive her family visits and when she can talk with the nurse. When asked to indicate what she desires to demand from a nurse in the retirement residence, she says shortly, with a smile that seems guilty, that what she wants is to be "well treated". Nobody ask her to give examples of what she means by "well treated", perhaps because before her presence on the workshop, was analyzed a text from a letter of a American nurse, Mrs. Rosemary Wills, who in order to prepare her future in a nursing home, wrote on the needs of aged people and on the attitude that nurses should have in order to respect old people' s dignity. It is outlined in this letter that – "Perhaps it will seem demanding, exaggerated in what I want, but what I want is just to receive affection, to be well treated, and a friendly, lovely person to take charge of me".

Authors
Figures
References
Citations
Keywords
Metrics