OMICS Group Conferences
Accelerating Scientific Discovery

3rd International Conference and Exhibition on
Biosensors & Bioelectronics
August 11-13, 2014   Hilton San Antonio Airport, San Antonio, USA

Estimate of the accuracy of the home-made respiratory monitoring system based on the MEMS acceleration sensor

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Purpose: The purpose of this study is to develop and estimate the accuracy of the home-made respiratory monitoring system based on MEMS (micro-electro-mechanical-system) acceleration sensor for the respiratory gated radiotherapy.

Methods and Materials: We developed respiratory monitoring system which was composed of 3 parts: sensing, looking, and listening. Sensing part is to detect the patient's respiratory motion by using the MEMS acceleration sensor, looking part is to display respiratory signal on the Tablet PC and listening part is to warn the excessive amplitude of breathing signal by ringing the alarm.

We evaluated accuracy for the signal from respiratory monitoring system by comparing with real motion. The MEMS acceleration sensor was placed on the 3 dimension moving phantom. It detected the motion and sent the electric signal to the Tablet PC.

Results: The uncertainty of the signal from the 3D moving phantom was measured about 0.01% in an amplitude and period for each interval. The signal from the respiratory monitoring system was well matched with the real motion.

Conclusion: In term of simplicity and convenience, we found the possibility of the respiratory monitoring system for the respiratory gated radiotherapy. So we expect more detail of study for more realistic situation and it can be established in near future.

Biography

Jiwon Sung graduated from Dongguk University with a degree in Physics. After graduating, she is majoring in Medical Physic in Korea University (pursuing Master's degree). She is a researcher in Kyung Hee University Hospital at Gangdong. She wrote two papers which were published at Progress in Medical Physics and received oral award in AOCMP & SEACOMP 2013.

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J Biosens Bioelectron 2014
ISSN: 2155-6210, JBSBE an open access journal

Biosensors & Bioelectronics-2014
August 11-13, 2014

Volume 5, Issue 3

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