초음파 센서를 활용한 삼킴 장애 모니터링 시스템 개발

유희천[1], 최영근[1], 양샤오펑[1], 김민재[1]

[1]포항공과대학교 산업경영공학과

Development of an Ultra-Sound Sensor Based Swallow Monitoring System for Dysphasia

Heecheon You[1], Younggeun Choi[1], Xiaopeng Yang[1], Minjae Kim[1]

[1]Department of Industrial & Management Engineering, Pohang University of Science & Technology

ABSTRACT

Objective: The present study developed a portable device using ultrasound sensors for assessment of swallowing. **Background:** The existing diagnosis methods of dysphagia such as videofluorocopic swallowing study (VFSS) and fiberoptic endoscopic evaluation of swallowing (FEES) have limitations due to radiation exposure and invasiveness, respectively. **Method:** The US-sensor based swallow monitoring system analyses swallowing signals using five measures (peak amplitude, duration, number of peaks, peak interval, and impulse). US signals which are caused by non-swallowing activities such as coughing, speaking, and body movement were identified by a microphone and a gyro sensor and then removed from measurement. **Results:** A clinical testing has been conducted to identify the characteristics of swallow signals measured from patients with dysphasia as compared with those of heathy people. **Discussion:** The proposed US-sensor based swallow monitoring system can be of an effective device for dysphasia diagnosis and treatment.

Keywords: Dysphagia, Swallow Monitoring, Quantitative Analysis, Clinical Testing

Corresponding author: Heecheon You (hcyou@postech.ac.kr)

Acknowledgements: The present research was jointly supported by the National Research Foundation of Korea (NRF) funded by the Ministry of Education, Science and Technology (NRF- 2018R1C1B5047805), and the Ministry of Trade, Industry, and Energy (No. 10063384; R0004840, 2018).