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Real time end-to-end glass break detection system using LSTM deep recurrent neural network

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Abstract

The aim of this paper is to propose a new design for a glass break detection system using LSTM deep recurrent neural networks at an end-to-end approach to reduce false positive alarm of state of the art glass break detectors. We utilized raw wave audio data to detect a glass break detection event in End-to-End learning approach. The key benefit of End-to-End learning is avoiding the need for hand-crafted audio features. To address the issue of a vanishing gradient and exploding gradient problem in conventional recurrent neural networks, this paper proposed deep long short term memory (LSTM) recurrent neural network to handle the sequence of the input audio data. As a real-time detection result, the proposed glass break detection approach has a clear advantage over the conventional glass break detection system, as it yields significantly higher precision accuracy (99.999988 %) and suffers less from environmental noise that might cause a false alarm. (C) 2019 The Authors. Published by IASE.

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Author Keywords: Glass break detection system; Deep learning; Long-short term memory; Deep recurrent neural network

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1.	One-class SVM based approach for detecting anomalous audio events By: Aurino, Francesco; Folla, Mariano; Gargiulo, Francesco; et al. 2014 INTERNATIONAL CONFERENCE ON INTELLIGENT NETWORKING AND COLLABORATIVE SYSTEMS (INCOS) Pages: 145-151 Published: 2014	Times Cited: 5
2.	Glass break detector Patent Number: 5,675,320A Inventor/Assignee: Cecic, D; Fong, HUS. U. S. Patent Published: 1997 Patent and Trademark Office, Washington, DC, USA	Times Cited: 1
3.	Glass break detector and a method therefor Patent Number: 5,543,783A Inventor/Assignee: Clark, FB; Lewis, KT. U. S. Patent Published: 1996 Patent and Trademark Office, Washington, DC, USA	Times Cited: 1
4.	Events detection for an audio- based surveillance system By: Clavel, C; Ehrette, T; Richard, G. P IEEE INT C MULT EX Pages: 1306-1309 Published: 2005 URL: https://doi.org/	Times Cited: 60
5.	An ensemble of rejecting classifiers for anomaly detection of audio events By: Conte, Donatello; Foggia, Pasquale; Percannella, Gennaro; et al. 2012 IEEE NINTH INTERNATIONAL CONFERENCE ON ADVANCED VIDEO AND SIGNAL-BASED SURVEILLANCE (AVSS) Pages: 76-81 Published: 2012	Times Cited: 16
6.	Automatic sound detection and recognition for noisy environment By: Dufaux, Alain; Besacier, Laurent; Ansorge, Michael; et al. P 10 EUR SIGN PROC C Pages: 1-4 Published: 2000 [Show additional data]	Times Cited: 8
7.	Learning to forget: Continual prediction with LSTM By: Gers, FA; Schmidhuber, J; Cummins, F NEURAL COMPUTATION Volume: 12 Issue: 10 Pages: 2451-2471 Published: OCT 2000	Times Cited: 454
8.	Glass break detector analog front-end using novel classifier circuit By: Gestner, Brian; Tanner, Jason; Anderson, David 2007 IEEE INTERNATIONAL SYMPOSIUM ON CIRCUITS AND SYSTEMS, VOLS 1-11 Book Series: IEEE International Symposium on Circuits and Systems Pages: 3586-3589 Published: 2007	Times Cited: 5
9.	SPEECH RECOGNITION WITH DEEP RECURRENT NEURAL NETWORKS By: Graves, Alex; Mohamed, Abdel-rahman; Hinton, Geoffrey 2013 IEEE INTERNATIONAL CONFERENCE ON ACOUSTICS, SPEECH AND SIGNAL PROCESSING (ICASSP) Book Series: International Conference on Acoustics Speech and Signal Processing ICASSP Pages: 6645-6649 Published: 2013	Times Cited: 1,092
10.	Gun type recognition from gunshot audio recordings By: Kiktova, E; Lojka, M; Pleva, M; et al. 3 INT WORKSH BIOM FO Pages: 1-6 Published: 2015	Times Cited: 5

URL: <https://doi.org/>
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11. **CONSTRUCTING LONG SHORT-TERM MEMORY BASED DEEP RECURRENT NEURAL NETWORKS FOR LARGE VOCABULARY SPEECH RECOGNITION** Times Cited: **24**
 By: Li, Xianggang; Wu, Xihong
 2015 IEEE INTERNATIONAL CONFERENCE ON ACOUSTICS, SPEECH, AND SIGNAL PROCESSING (ICASSP) Book Series: International Conference on Acoustics Speech and Signal Processing ICASSP Pages: 4520-4524 Published: 2015

12. **SecureHouse: a home security system based on smartphone sensors** Times Cited: **1**
 By: Mahler, M.A.; Qinghua Li; Ang Li
 2017 IEEE International Conference on Pervasive Computing and Communications (PerCom) Pages: 11-20 Published: 2017

13. **Alarm detection device and method** Times Cited: **1**
 Patent Number: 9,191,762B1
 Inventor/Assignee: Matesa, JM.
 U. S. Patent Published: 2015
 Patent and Trademark Office, Washington, DC, USA

14. **On the difficulty of training recurrent neural networks** Times Cited: **277**
 By: Pascanu, R.; Mikolov, T.; Bengio, Y.
 Journal of Machine Learning Research, JMLR Volume: 28 Issue: 3 Pages: 1310-1318 Published: 2013

15. **Multi frame size feature extraction for acoustic event detection** Times Cited: **3**
 By: Peng, L; Yang, D; Chen, X.
 STRUCT INFRASTRUCT E Pages: 1-4 Published: 2014
 URL: <https://doi.org/>

16. **Direction- sensing acoustic glass break detecting system** Times Cited: **1**
 Patent Number: 5,471,195A
 Inventor/Assignee: Rickman, SA.
 U. S. Patent Published: 1995
 Patent and Trademark Office, Washington, DC, USA

17. **Long Short-Term Memory Recurrent Neural Network Architectures for Large Scale Acoustic Modeling** Times Cited: **221**
 By: Sak, Hasim; Senior, Andrew; Beaufays, Françoise
 15TH ANNUAL CONFERENCE OF THE INTERNATIONAL SPEECH COMMUNICATION ASSOCIATION (INTERSPEECH 2014), VOLS 1-4 Book Series: Interspeech Pages: 338-342 Published: 2014

18. **General information about piezoelectric sensors** Times Cited: **6**
 By: Sharapov, V.
 Piezoceramic Sensors Pages: 1-24 Published: 2011
 Publisher: Springer, Berlin, Heidelberg, Germany
 URL: <https://doi.org/>

19. **Estimation of cluster sensors' probability of detection for physical protection systems evaluation** Times Cited: **2**
 By: Zidan, WI.
 Journal of Physical Security Volume: 8 Issue: 1 Pages: 40-54 Published: 2015

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