Gmail Atsuhiro Fujii <atsu3.n9@gmail.com>

Fwd: [ISWC 2020] Decision for submission 1087

1 件のメッセージ

Kazuya Murao <murao@cs.ritsumei.ac.jp> 2020年7月28日 14:54
To: atsuhiro.fujii@iis.ise.ritsumei.ac.jp

藤井君
村尾です.

残念ながら不採録でした.
強いリジェクトが無いので，全然ダメというわけじゃないけど，
強くアクセプトする人もいないという感じかな.

次どうするかですが， https://docs.google.com/spreadsheets/d/1elwMHLs3QbvK2Nv_oS7KC9OzMNF4iXxTSd0El3z5fNg/edit#gid=5894141
に国際会議まとめています.
時期的にはMoMMが妥当かなと思います．ショート5ページ．たぶん現地には行けないと思うけど．日本人が多い会議.
それか奈良であるICDCNのワークショップかな．現地開催があるか不明だけど.
MUMはやや難しい会議です．ショート4ページ．ドイツも年内はむずかしいかな.

年度末の会議はもしかしたら現地行けるかもしれないけどわかんないし，
新ネタ頑張って投稿したほうが良いかなと思っています.

---------- Forwarded message ---------
From: **Jen Healey, Thomas Ploetz** <iswc20a@precisionconference.com>
Date: Tue, 28 Jul 2020 at 06:05
Subject: [ISWC 2020] Decision for submission 1087
To: Kazuya Murao <murao@cs.ritsumei.ac.jp>

Dear Kazuya Murao -

Your submission has been reviewed for ISWC 2020, and we regret to inform you that

1087: "User Identification Method based on Head Shape using a Helmet with Pressure Sensors"

has not been accepted for publication. The conference received a very large number of submissions, and the quality was quite high.

The reviews of your submission can be found at the end of this email. We do hope you will take into account the reviewers' comments and submit your work to the conference next year, or to the ISWC 2020 adjunct program tracks: Workshops, Posters, Demos, Doctoral Colloquium, and the Design Exhibition (http://iswc.net/iswc20/) which have upcoming deadlines.

We thank you for your submission and hope that the committee's comments have been helpful to you. We hope to see you at the conference!

Sincerely,

Jen Healey, Thomas Ploetz
ISWC 2020 PC Co-Chairs

========== Reviews ==========

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primary review
score 3/6

Feedback from Program Committee Meeting

The overall discussion recommendation is to reject. While there are several concerns that may be addressable, given the constraints of the year, we do not feel that this paper is ready for acceptance. The primary issues noted were:
1. The motivation for the contribution is weak. While it is possible to assess users based on head shape, there are many other feasible solutions that would be worthwhile. There are several other applications where helmet embedded pressure sensing would be useful, such as comfort, sizing or even expanding the identification problem to more uses such as industrial workers, military/police officers or players on the sports field (e.g., American football, skiing). In these settings, continuous identification is more useful than the stated case.
2. There were many details missing from the paper, such as anthropometry of the subjects, the potential contribution of confounding variables (e.g., changes in hair style, similar head shapes donning/doffing tightness, motion artifact).
4. For the technology choice, do the sensors microcontroller affect the safety of the helmet in any way? This should be discussed. If the instrumentation of sensors affects the primary role of the helmet in any way, it is not usable.
3. The experimental design was confusing, specifically with regard to the replicates, number of trials, whether or not the system was recalibrated between sessions, or what the subjects were doing during data collection. They used a relatively small sample size (9 subjects) given the strength of their claims.
4. The classification problem is not clear, is it multi-class classification, with each class referring to the participant or is it a binary classification for each user and then the results are merged? It is not clear what the authors refer to as 'features'. Is it the raw data from the sensor or other features that have been extracted but not reported? How did the authors split the data into 80% and 20%? In particular, did the authors consider avoiding temporal leak, i.e., to avoid the model to be trained with data from the future? It is not clear what data set was used for hyperparameter tuning for SVM. For authentication, the authors claim that they use FAR, FRR, and EER as indicators of authentication accuracy, but show only the results for EER.
5. The related work does not cover all relevant literature (e.g., [1]). Further, it references work (i.e., behavioral approaches or Head State Recognition) that do not seem to be well suited for this task.
6. The discussion is not in depth. Aspects such as scalability or advantages and disadvantages compared to other approaches are not discussed appropriately.

Additional minor formatting issues were noted:
- Section 3.4: Formula exceeds column width.
- Table/Figure references should not be in bold font.

Related references:
[1] https://dl.acm.org/doi/abs/10.1145/2858036.2858152
[2] https://ieeexplore.ieee.org/document/8311460
[3] https://arxiv.org/abs/1807.03216

Confidence

Very confident - I am knowledgeable in the area

Contribution to ISWC

This paper develops a wearable pressure sensor suite for identifying head shape in helmets. Embedded pressure sensing in helmets has useful application for sizing and comfort, but that was not the objective achieved here. Their work also informs which regions of the head may be most useful to differentiate between users.

Overall Rating

Maybe reject: I would agree with rejecting this paper.

The Review

This paper develops a statistical methodology to identify helmet users with

embedded pressure sensors.

Novelty: This is an interesting approach, but I question the utility and robustness of the findings. The authors did not discuss potential limitations such as: influence of hair and changes in style, changes in donned/doff tightness (although this may have been considered due to the 30 minute wait period between trials, I would argue that longterm changes cannot be assessed in that manner), differentiability between similarly shaped heads, robustness of a solution in challenging work environments.
Impact: Helmet comfort, particularly for long periods of time, are of considerable interest, specifically when considering sizing. This use case application of the work would be of greater impact than helmet identification, where there are many other more simple and robust methodologies that would be of greater use. One of the use cases matched user heads with a username, which brings into question if they already have the username, why do you need a solution like this? Helmet fit was not discussed. Their results do inform which regions of the head are most useful for differentiating head shape, which is of independent interest, even though not highlighted.
Rigor: The authors did not report any anthropometric dimensions of those tested, so it is difficult to determine the degree of differentiation their method can achieve (I.e. when people have similar head shapes). FSRs are notoriously unstable and require constant recalibration prior to use. The authors did not describe how they achieved this. It was also not mentioned as a limitation, which would make it challenging for implementation. Was the hardware powered off during the 30 minute period between data collection sets? Was 30 minutes the minimum or maximum between data collection?
Writing: I did not note any significant issues with writing. Section 2.2 does not put the prior work into context, it just states what was done.

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secondary review
score 3/6

Confidence

Very confident - I am knowledgeable in the area

Contribution to ISWC

The paper presents a wearable identification and authentication approach using pressure sensing. This approach allows for an implicit way of user identification/authentication. The authors present a first evaluation using 9 participants achieving a low EER.

Overall Rating

Maybe reject: I would agree with rejecting this paper.

The Review

Idea
The overall idea is interesting. Although I am not entirely convinced of the practicality compared to way simpler approaches (e.g., using an NFC reader and mobile app). The identification needs to be done very rarely and is not safety critical.

Related Work
The related work does not cover all relevant literature (e.g., [1]). Further, it references work (i.e., behavioral approaches or Head State Recognition) that does not seem to fit well.

Participants and Sample Size
The participants need to be described in more detail. Besides the mean age, I would also expect the distribution of the age and other aspects on the users such as head circumference. Further, I am wondering if a sample size of nine users is appropriate.

Data Collection

The data collection process is unclear. Participants put on the helmet twice for 2 seconds each. It seems that this procedure is repeated 10 times resulting in 20 samples per participant. It remains unclear when and how it was recorded and what users where doing during recording.

Discussion
The discussion is shallow. Aspects such as scalability or advantages and disadvantages compared to other approaches are not discussed appropriately.

Minor
- Section 3.4: Formula exceeds column width.
- Table/Figure references should not be in bold font.

Overall, I am neutral on this work. The presented work is in general sound but the presentation needs to be reworked.

[1] https://dl.acm.org/doi/abs/10.1145/2858036.2858152
[2] https://ieeexplore.ieee.org/document/8311460
[3] https://arxiv.org/abs/1807.03216

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reviewer 3 review
score 4/6

Confidence

Very confident - I am knowledgeable in the area

Contribution to ISWC

This paper presents an automatic approach to identify and authenticate a user based on user's head shape. To this goal, they implement a helmet device with 32 pressure sensors and use the data collected from these sensors to build the models for identifying and authenticating the user. They conduct a user study with 9 participants and ask the participants to put the device on and off for 2 seconds in each round. For identifying the user, they extract features from 32 sensors and provide them as input to SVM classifier. The best performance is achieved using the data from all sensors but the same performance can be achieved using less sensors. Whereas, to authenticate the user they compute the Mahalanobis distance of user's data with the existing data in the database.

Overall Rating

Maybe accept: I would agree with accepting this paper.

The Review

Overall, the paper is well written and easy to follow and has 4 pages as requested in the guidelines for Notes. My main concerns with the paper are the steps followed for the data analysis and its implications.

While the work seems novel and with possibility of many applications i.e., identify industrial workers, military/police officers or players on the sports field (e.g., American football, skiing) as mentioned in the paper, I find it difficult to understand how and why this is better than existing methods and why continuous identification/authentication of the user is needed instead of one-time identification in such settings. I strongly encourage the authors to provide a stronger argument about the applicability of their approach.

Data analysis: The classification problem is not clear, is it multi-class classification, with each class referring to the participant or is it a binary classification for each user and then the results are merged? It is not clear what the authors refer to as 'features'. Is it the raw data from the sensor or other features that have been extracted but not reported? Please make these points clearer. How did the authors split the data into 80% and 20%? In particular, did the authors consider avoiding temporal leak, i.e., to avoid the model to be trained with data from the future? It is not clear what data set was used for hyperparameter tuning for SVM. For authentication, the authors claim that they use

FAR, FRR, and EER as indicators of authentication accuracy, but show only the results for EER. I strongly encourage the authors to either add the other metrics or update the paper accordingly.

The limitations, implications and future work should be briefly discussed.

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reviewer 4 review
score 3/6

Confidence

Very confident - I am knowledgeable in the area

Contribution to ISWC

This work instruments a helmet with pressure sensors to identify users with a 100% accuracy.

Overall Rating

Maybe reject: I would agree with rejecting this paper.

The Review

The paper is easy to follow, but there are a few grammatical errors and typos. The paper can benefit from a proofread.

The contribution of the paper was clear. But, the motivation was a little thin. To my knowledge, helmets are not used for authorization- so trespassing is not a huge issue. If it is, then the authors need to emphasize it more and make it clear to the readers why. Similarly, helmets in sports and motorcycles are generally not shared. The authors need to clear articulate either a need or new opportunities that their work will enable.

Why would sensors connected to a person's body need the helmet for ID? A wearable has a 1-1 device to user mapping. The camera/IMU/any other sensor on the user's body itself is identifying in itself!

The past work is properly covered and characterized.

The assumption that only authorized users would wear the helmet renders the presented use-case for trespasser moot. A trespasser will simply wear the helmet and it will match the person to their nearest match.

The implementation the system description looks fine.

The analysis was done properly and the results were well explained.

Does the added sensor and potentially microcontroller affect the safety of the helmet in any way? This is a glaring discussion that is needed in the paper. If the instrumentation of sensors affects the primary role of the helmet in any way, it is not usable.

Overall, I commend the authors on a good execution- however, lack of clear motivation, strong assumptions needed for the system to work, and limited discussion prevent me from recommending acceptance at the moment.

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村尾和哉(立命館大学情報理工学部 准教授) / Kazuya MURAO, Associate Professor, Dr.
College of Info. Sci. and Eng., Ritsumeikan Univ. 1-1-1 Nojihigashi, Kusatsu, Shiga 525-8577, Japan
murao@cs.ritsumei.ac.jp http://www.muraokazuya.net