Qeios

Peer Review

Review of: "Fabrication of Soft and Comfortable Pressure-Sensing Shoe Sole for Intuitive Monitoring of Human Quality Gaits"

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The following recommendations should be addressed before publication to enhance the study's clarity, scientific rigor, and impact.

1. Although the devices' structure is simple, the authors do not show that this device can be reproduced. Therefore, the authors should provide a figure containing the relationship between the number of devices (at least 20 devices) and resistance. For example, Figure 9(b) of https://doi.org/10.1039/D1RA07490C. This will help to improve your manuscript more reliably.
2. The authors claim that the graphene nano-powder has a thickness of 5-20 nm. Are there any SEM images to confirm the thickness of the graphene nano-powder? Please add SEM or AFM images to verify the thickness in your manuscript.
3. The area of the ecoflex/graphene composites is 15 x 15 mm^2, but the mold area is 15 x 30 mm^2 as shown in Figure 3.2. If the composites were cut in half, please state this in your manuscript, because this will confuse the reader.
4. If materials in this research were purchased without being synthesized, the authors should address the manufacturers and their locations. For example, graphene nano-powder (Sigma-Aldrich, Missouri, USA).
5. Currently, many pressure sensors use polymer/carbon composites with the sandwiching structure as follows:

https://doi.org/10.1007/s10854-022-09149-x

https://doi.org/10.3390/polym12071499

https://doi.org/10.1016/j.carbon.2021.06.049

https://doi.org/10.1016/j.nantod.2022.101698

https://doi.org/10.3390/s21020341

What is the difference between your work and their works? The authors should include a comparison table in the manuscript containing the range of pressure, sensitivity, response time, recovery time, and stability. This will improve the quality of the manuscript.

1. The stability of the sensors should be provided in the manuscript because the sensors were used with the foot, which receives periodic pressure.
2. The variable symbols in equation 3.1 do not match Figure 3.12. A representation like this will confuse readers who do not understand the circuit. Choose one: Rm or R1, and Rps or R2.
3. The authors should illustrate the code in the supplementary material for the reviewer to check because there is too much copied and pasted code nowadays.
4. What is the optimized condition? This work only has one condition, which is 5 mg of graphene. Not even knowing the wt % because of the unknown weight of Ecoflex-0030 (1A:1B). In the scientific report, you should illustrate more than 4 conditions.
5. Further from comment 8, if you mix 5 mg of graphene with Ecoflex-0030, which has 1 g of A and 1 g of B, will the composite have the resistance as well as the 5 mg of graphene with Ecoflex-0030, which has 2 g of A and 2 g of B, or not? If your common sense says not, please do more conditions and address each as weight percentage (wt%).
6. There are many more questions, but since this is a preprint, I don't want to comment or ask any more questions.

Attachments: available at https://doi.org/10.32388/1PKPU0

Declarations

Potential competing interests: No potential competing interests to declare.