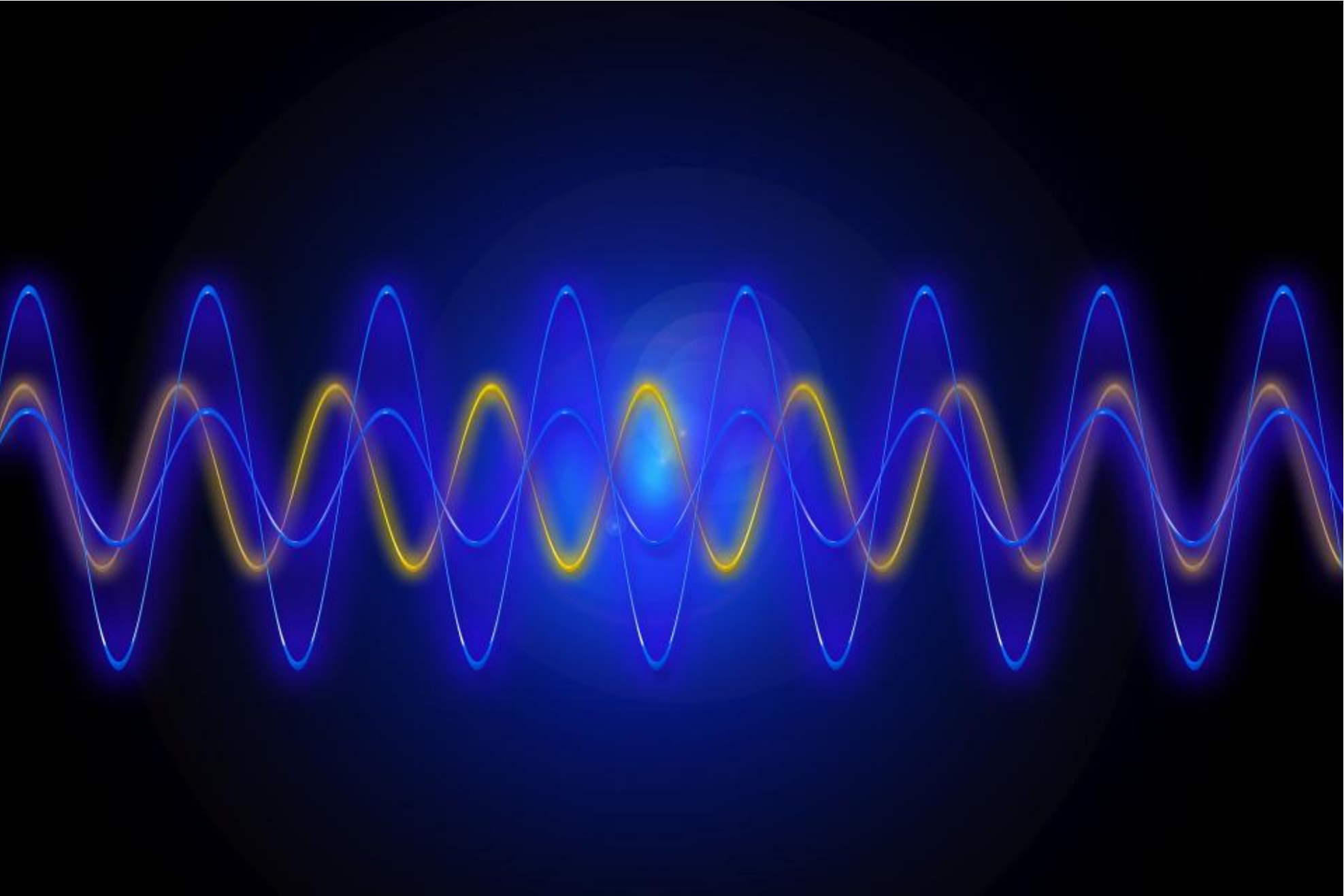


Datasets

Standard Dataset

RADAR-BASED HAND, ARM, AND BODY GESTURES



Citation Author(s):
Arthur Sluyters  (<https://orcid.org/0000-0003-0804-0106>) (Université catholique de Louvain)
Sébastien Lambot  (<https://orcid.org/0000-0002-0358-481X>) (Université catholique de Louvain)
Jean Vanderdonckt  (<https://orcid.org/0000-0003-3275-3333>) (Université catholique de Louvain)

Submitted by:
[Arthur Sluyters](#)

Last updated:
Mon, 04/08/2024 - 08:53

DOI:
[10.21227/5n08-v130](https://doi.org/10.21227/5n08-v130)

License:
[Creative Commons Attribution](#)

 463 Views

Categories:
[Signal Processing](#)



Keywords:
FMCW radar, Hand gesture dataset

0 ratings - Please [login](#) to submit your rating.

ACCESS DATASET

CITE

SHARE/EMBED

ABSTRACT

For gesture recognition, radar sensors provide a unique alternative to other input devices, such as cameras or motion sensors. They combine a low sensitivity to lighting conditions, an ability to see through surfaces, and user privacy preservation, with a small form factor and low power usage. However, radar signals can be noisy, complex to analyze, and do not transpose from one radar to another.

To overcome these limitations, we introduce an electromagnetic model and inversion-based approach for radar signal processing that satisfies three properties: radar system invariance (the output signal is normalized to become independent from the radar), background scene invariance (the output signal is no longer affected by the background scene), and one-shot calibration (the radar needs to be calibrated only once).

Two experiments are conducted to evaluate the efficacy of our approach on a set of 20 hand gesture classes and to identify differentiable subsets of gestures, reaching up to 90.58%, 97.78%, and 98.54% accuracy on the full gesture set, on a subset of 12 and 8 gesture classes in a user-dependent scenario, respectively. Our approach also shows promising results in a mixed scenario, for customized gestures.

This dataset contains the raw radar signal of the 20 gestures, as well as the signal at two stages of our signal processing dataflow. It also contains the results of our two experiments.

Funding Agency: Fonds de la Recherche Scientifique - FNRS
Grant Number: 40001931, 40011629

DATASET FILES

- IEEE2023 Dataset (raw, users 1-3): Raw radar data from users 1 to 3 IEEE2023 Dataset (users 1-3).zip (4.05 GB)
- IEEE2023 Dataset (raw, users 4-6): Raw radar data from users 4 to 6 IEEE2023 Dataset (users 4-6).zip (4.46 GB)
- IEEE2023 Dataset (filtering, users 1-6): Radar data from users 4 to 6 after the "filtering" stage of the processing dataflow IEEE2023 Dataset (filtering, users 1-6).zip (7.62 MB)
- IEEE2023 Dataset (time gating, users 1-6): Radar data from users 4 to 6 after the "time gating" stage of the processing dataflow IEEE2023 Dataset (time gating, users 1-6).zip (1,000.05 MB)
- IEEE2023 Testing Results TestingResults.zip (249.02 kB)
- IEEE2023 Testing Results (figures) TestingResultsParsed.zip (39.17 MB)

LOGIN TO ACCESS DATASET FILES

QUESTIONS?

✉ Login to Send Author a Private Message

⚠ Report a problem with this Dataset