

# RF-Identity: Non-Intrusive Person Identification Based on Commodity RFID Devices

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Person identification plays a critical role in a large range of applications. Recently, RF based person identification becomes a hot research topic due to the contact-free nature of RF sensing that is particularly appealing in current COVID-19 pandemic. However, existing systems still have multiple limitations: i) heavily rely on the gait patterns of users for identification; ii) require a large amount of data to train the model and also extensive retraining for new users and iii) require a large frequency bandwidth which is not available on most commodity RF devices for static person identification. This paper proposes RF-Identity, an RFID-based identification system to address the above limitations and the contribution is threefold. First, by integrating walking pattern features with unique body shape features (e.g., height), RF-Identity achieves a high accuracy in person identification. Second, RF-Identity develops a data augmentation scheme to expand the size of the training data set, thus reducing the human effort in data collection. Third, RF-Identity utilizes the tag diversity in spatial domain to identify static users without a need of large frequency bandwidth. Extensive experiments show an identification accuracy of 94.2% and 95.9% for 50 dynamic and static users, respectively.

CCS Concepts: • **Human-centered computing** → **Ubiquitous and mobile computing**.

Additional Key Words and Phrases: Person identification, RFID tag, body feature, Deep learning

## ACM Reference Format:

Chao Feng, Jie Xiong, Liqiong Chang, Fuwei Wang, Ju Wang, and Dingyi Fang. 2021. RF-Identity: Non-Intrusive Person Identification Based on Commodity RFID Devices. *Proc. ACM Interact. Mob. Wearable Ubiquitous Technol.* 5, 1, Article 9 (March 2021), 23 pages. <https://doi.org/10.1145/3448101>

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2474-9567/2021/3-ART9 \$15.00

<https://doi.org/10.1145/3448101>