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**ABSTRACT**

Attributed to the omnipresence of the radio signals for communications, sensing and recognition utilizing the Wi-Fi signals has significant advantage in terms of accessibility over conventional sensing means such as the camera. However, utilizing the raw Wi-Fi signals to capture in-air handwritten signatures for identity verification is yet a challenging task. In this paper, we propose a system for identity verification based on the handwritten signature signals captured by the Wi-Fi Channel State Information (CSI). A triplet network is adopted to learn the correlation between the captured signals and the user identities. To facilitate a fast converging loss model, a kernel and the range space learning is initially adopted for mining the triplet inputs. Subsequently, the triplet network is trained on a ConvNet structure based on the mined triplet inputs. Our experiments on a Wi-Fi dataset collected in-house show encouraging verification accuracy with faster training loss convergence comparing with that of the baseline triplet network and the Siamese network.

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**Keywords**

Wi-Fi signature signal; in-air handwritten signature verification; the Kernel and the Range space projection learning; triplet network

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# ACKNOWLEDGMENTS

Our thanks to ACM SIGCHI for allowing us to modify templates they had developed.

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1. Bowman, M., Debray, S. K., and Peterson, L. L. 1993. Reasoning about naming systems. *ACM Trans. Program. Lang. Syst.* 15, 5 (Nov. 1993), 795-825. DOI= <http://doi.acm.org/10.1145/161468.16147>.
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