Analysis of "AmorFi: Amorphous WiFi Networks for High-density Deployments"

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For this assignment we reviewed the paper "AmorFi: Amorphous WiFi Networks for High-density Deployments", details of which can be found in [1].

Summary

In [1] the usage of mobile network techniques in high density WiFi networks is investigated. Typical WiFi networks in places like convention venues have to be greatly over provisioned to be able to serve a higher than average number of users in one area. The paper proposes to use the core idea of C-RAN, which is to separate the RF transmissions from the baseband processing. Tests and simulations showed that AmorFi significantly outperforms traditional WLAN schemes.

Critique

- 2.4 Ghz range only has 3 orthogonal channels, while 5Ghz has 9. This means that when using the 5Ghz band, it is always possible to distribute the channels without causing interference. (think of it as a cellular network, you would have hexagons (6 neighbours)). However, it is clear that this wouldn't always be possible with the 3 orthogonal channels of the 2.4Ghz band.
When this is the case, they just assign neighbouring clusters the same frequency. What we think is missing from the paper is a discussion on the usage of the non-orthogonal channels that are available in the 2.4Ghz band.

- In section 3.2 they discuss the algorithm they developed and used to determine the clusters and their channel assignment.
The implementation of the algorithm can't be found. It was explained in detail, so it should be reproducible, but the source code would have been a nice addition.

- There are some measurements missing in section 5.4.1.
They do acknowledge it and say it is in the interest of space, but they don't make it available elsewhere either.

- They fail to provide the NS3 code that was used in section 5.5

- They don't mention what traffic characteristics and/or data rate was used to simulate the users.

References

[1] Ramanujan K Sheshadri, Mustafa Y Arslan, Karthikeyan Sundaresan, Sampath Rangarajan, and Dimitrios Koutsonikolas. Amorfi: Amorphous wifi networks for high-density deployments. In *Proceedings of the 12th International on Conference on emerging Networking EXperiments and Technologies*, pages 161–175. ACM, 2016.