

In This Issue. . .

- **Illustration:** Orthogonality property in Massive MIMO
- **One Day Tutorial:** One Day Tutorial on Machine Learning, Deep Learning and Computational Intelligence
- **Call for Papers:** Workshop on Machine Learning, Deep Learning and Computational Intelligence for Wireless Communication (MDCWC2020)

Dear friends! **COMPSIG NITT** is a monthly newsletter to share the research work done in the Pattern recognition and computational intelligence laboratory, Department of Electronics and Communication Engineering, National Institute of Technology Trichy.

Concepts, Ideas pertaining to Computational intelligence, Pattern recognition and Signal processing are also included in this newsletter.

We expect the feedback, comments and articles from you all.

Volume 6, Issue 2: February 2020

Team members

1. Dr.E.S.Gopi, Co-ordinator.
2. G.JayaBrindha, Ph.D. Scholar.
3. Neema. M, Ph.D. Scholar.
4. Rajasekharreddy Poreddy, Ph.D Scholar.
5. Vinodha K, Ph.D Scholar.
6. Shailendra Singh, M.Tech, Communication systems.
7. Mayank Lauwanshi, M.Tech, Communication systems.

Scan the QR code for previous issues of our newsletter



Illustration of the Key point in Massive MIMO

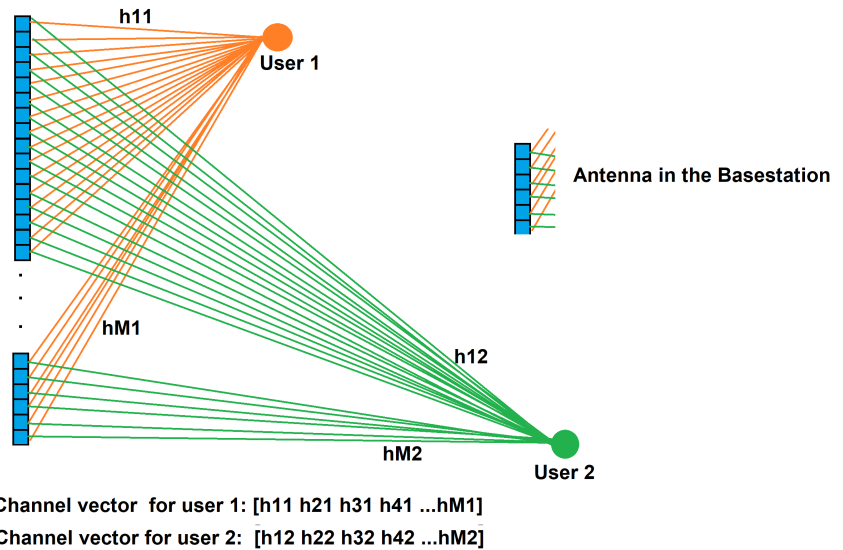


Fig.1:Massive MIMO model for 2 user case

Fig. 1 shows the Massive MIMO model, where the channel vector for user 1: $[h_{11}, h_{21}, \dots, h_{M1}]$, is assumed to be Gaussian distributed with variance β_1 and the channel vector for user 2: $[h_{12}, h_{22}, \dots, h_{M2}]$, is assumed to be Gaussian distributed with variance β_2 . From Fig. 2, it can be observed that, as the number of antennas (M) in the base station increases, the dot product of the channel vectors between user 2 and user 2 is converging to a constant whereas the dot product of the channel vectors between user 1 and user 2 is converging to 0 which serves as the key point in Massive MIMO.

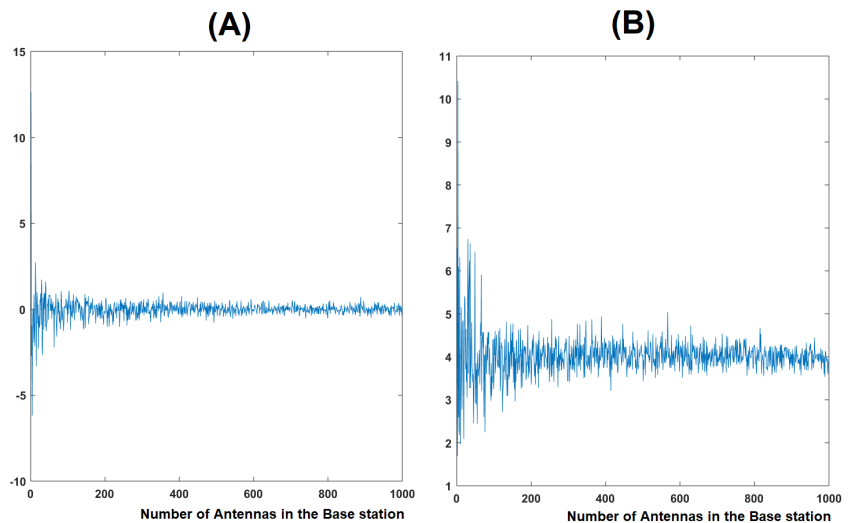


Fig.2: (A) Normalized dot product of the channel vectors between User 1 and User 2 and (B) Normalized dot product of the channel vectors between User 2 and User 2.

Back to Contents

© 2020 by PRCI lab. All rights reserved. No part of this publication may be reproduced, distributed, or transmitted in any form or by any means, without the prior permission.

One Day Tutorial on Machine Learning, Deep Learning and Computational Intelligence

Tutorial ML, DL, and Computational intelligence is based on the book Pattern Recognition and The Computational Intelligence, 2019, Transactions on computational Science and intelligence, Springer publications authored by Dr.E.S.Gopi, Co-ordinator for the event MDCWC 2020. He is also the Guest speaker for the IEEE Training School on Machine Learning for Wireless Communication

Tentative Date : 12 May 2020

Link to the [Book](#)

[Back to Contents](#)

Call for Papers For Workshop on Machine Learning, Deep Learning and Computational Intelligence for Wireless Communication (MDCWC2020)

The workshop invites original research contributions/survey paper under the following categories.

1. The data driven wireless communication applications using ML, DL and Computational intelligence.
2. Optimization algorithm/technique for ML, DL and Computational intelligence.
3. Related mobile data applications.

Important Dates

- Paper Submission: 20 March 2020
- Acceptance notification: 02 April 2020
- Camera ready submission and registration: 15 April 2020

Link to the [brochure](#) . Reference for related works

- [Machine Learning Paradigms for Next-Generation Wireless Networks](#)
- [Machine Learning for Wireless Communication Channel Modeling: An Overview](#)
- [CRAWDAD dataset](#)
- [UMass Trace Repository](#)

[Back to Contents](#)

Quotes

“The purpose of education is to make good human beings with skill and expertise... Enlightened human beings can be created by teachers” — Dr.A.P.J.Abdul Kalam

© 2020 by PRCI lab. All rights reserved. No part of this publication may be reproduced, distributed, or transmitted in any form or by any means, without the prior permission.

On-going Research

- Investigating Regression techniques for solving the sunflower leaf segmentation problem
- Application of machine learning techniques in next generation wireless communication
- Classification of Music composition styles using probabilistic generative model
- Engine health monitoring using Machine learning, Deep learning and Computational intelligence
- Power allocation & Capacity maximization in NOMA using computational intelligence
- Millimeter wave channel estimation using computational Intelligence

[Back to Contents](#)

Feedback

COMPSIG NITT invites articles and innovative ideas from readers for the [Reader's Space](#) column. We expect feedback and comments to monthly newsletter [COMPSIG NITT](#) . Readers can share their views in our facebook page, [COMPSIG-NITT](#). Those who are interested can be a part of the facebook group.

Follow us on Research gate: [COMPSIG NITT](#)

[Back to Contents](#)

Contact Information:

[Pattern Recognition and Computational Intelligence Laboratory](#),

Department of Electronics and Communication Engineering,
National Institute of Technology Trichy - 620015

E-mail: esgopi@nitt.edu