

Seminar

# Graph Capacity (Intro.)

Specifically the following topics will be touched:

1. Shannon Capacity of A Graph
2. Zero-Error Capacity
3. Zero-Error Applications (Perfect Hash Function, Superimposed Codes)
4. Sperner Capacity
5. Lovasz Number
6. Haemers Bound
7. Confusability Graph
8. Hyper-graph Capacity
9. Graph Alphabets:

- Independenc Number
- Chromatic Number
- Graph Entropy
- Graph Powers

## Prerequisites

Basics of the following:

1. Information Theory
2. Graph Theory
3. Coding Theory
4. Channel Coding

## Contact

References:

1. Alon, N. "**The Shannon Capacity of a Union.**" *Combinatorica* 18, 301-310, 1998.
2. Haemers, W. "**An Upper Bound for the Shannon Capacity of a Graph.**" In *Algebraic Methods in Graph Theory*. Szeged, Hungary: pp. 267-272, 1978.
3. Lovász, L. "**On the Shannon Capacity of a Graph.**" *IEEE Trans. Inform. Th.* IT-25, 1-7, 1979.
4. Shannon, C. E. "**The Zero-Error Capacity of a Noisy Channel.**" *IRE Trans. Inform. Th.* 2, 8-19, 1956.
5. Cohen, G., Körner, J. and Simonyi, G., 1990. "**Zero-error capacities and very different sequences.**" In *Sequences* (pp. 144-155). Springer, New York, NY.
6. Korner, Janos, and Alon Orlitsky. "**Zero-error information theory.**" *IEEE Trans. Inform. Th.* IT-25, no. 6 (1998): 2207-2229.

## Advisors

Mohammad Salariseddigh