

NATbox: Network Analysis Toolbox in R

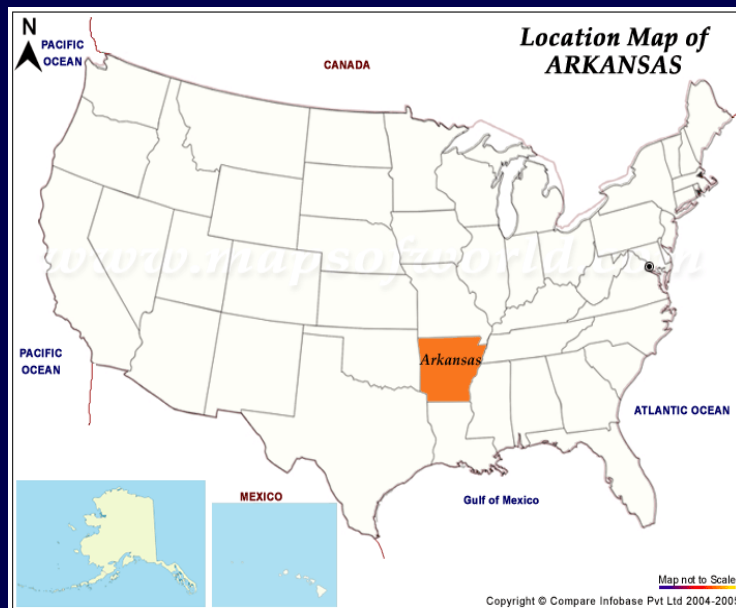
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Motivation

- Understanding gene interactions or *functional relationships (FRs)* since they work as a system, eventually form a *network*
- *Not everybody needs to know everything!!*
- Existing analysis toolboxes infer pathways:
from apriori knowledge - *GenMAPP, FatiGO, GSEA*
from the given data with no apriori knowledge - *ARACNE, CYTOSCAPE, BANJO and BNARRAY*
- Factors like *non-canonical signaling mechanism* (Zhou et al., 2007), *cross-talk* (Sachs et al., 2005) and *population heterogeneity* demands the later

The word "Objectives" is centered at the top of the slide in a white serif font. It is flanked by five circles of varying shades of blue. The circles are arranged in a horizontal line, with the word "Objectives" overlapping the second and fourth circles from the left. The first and fifth circles are solid blue, while the second, third, and fourth are hollow with a blue outline.

Objectives

- Intended users
- Provide a menu-driven GUI (parameter recommendations)
- Act as an interface
- Encourage reproducibility and transparency of research
- Incorporate R-functions directly

7% NATbox: A Network Analysis Toolbox



File Imputation Correlation Metrics Bayesian Networks Text Mining Social Network Analysis Metrics Help

Number of neighbors to be used in the imputation

E.g.:10

Row max, The maximum percent missing data allowed in any row

E.g.:50%

Column max, The maximum percent missing data allowed in any column

E.g.:80%



TextPad - C:\NATBox\input_files\dat_schs1.txt

C:\NATBox\input_files\dat_schs1.txt

praf	pmek	plcg	PIP2	PIP3	p44/42	pakts473	PKA	PKC	P38	
26.4	13.2	8.82	18.3	58.8	6.61	17	414	17	44.9	40
35.9	16.5	12.3	16.8	8.13	18.6	32.5	352	3.37	16.5	61.5
59.4	44.1	14.6	10.2	13	14.9	32.5	403	11.4	31.9	19.5
73	82.8	23.1	13.5	1.29	5.83	11.8	528	13.7	28.6	23.1
33.7	19.8	5.19	9.73	24.8	21.1	46.1	305	4.66	25.7	81.3
18.8	3.75	17.6	22.1	10.9	11.9	25.7	610	13.7	49.1	57.8
44.9	36.5	10.4	132	16.3	8.66	17.9	835	15	35.9	18.1
47.4	15	14.6	30.5	17.5	20.2	45.3	466	6.44	24.4	20
104	61.5	10.6	21.1	41.8	11.5	23.5	445	29.2	61	25.3
21.1	21.5	1.88	205	43.7	13.2	135	213	14.6	26.7	101
16.4	16.4	14.5	17	11.2	21.9	34.6	449	20.4	44.9	24.1
74.3	22.9	7.5	15.5	26.2	20.9	36.5	389	31.9	71	35.5
85.1	39.6	8.9	64.9	11.7	6.67	12.2	528	17.9	44.1	118
36.8	29.2	5	9.06	15.5	17.9	17.9	400	14.6	41.4	151
29.2	24.1	10.2	16	46.6	8.82	7.23	500	9.73	19.1	7.91
50	13.8	11.9	13.2	11.3	18.1	27.9	392	56.2	77	1
26.2	26.7	21.3	10.9	14.7	9.06	37.9	89	40	65.5	1.42
39.6	38.2	10.5	92.2	22.7	27.6	31.3	223	16.5	30.8	7.64
30.5	19.8	7.5	133	15.7	19.1	36.2	319	24.1	37.2	17.2
49.1	16.5	13.3	141	25.7	31.1	62.1	710	14.2	27.4	22.1
38.5	8.9	11.3	85.8	17.9	12.1	35.9	843	12	28.4	20.9
31.6	17.8	14.5	10.6	4.91	10.2	23.9	276	13.8	28.4	12.7
41	27.9	1	137	23.9	30.2	50	965	1	84.3	4.61
104	61.5	10.6	21.1	41.8	11.5	23.5	445	29.2	61	25.3
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26.2	26.7	21.3	10.9	14.7</						



Future work

- Discretization options for heterogeneous data
- Handling time-course expression data
- Documentation and examples of synthetic network
- Interface to other packages
- Blog creation



Acknowledgements

- Dr. Radhakrishnan Nagarajan
- Marco Scutari
- Michael Bauer
- R03LM008853 & NIH Grant # P20 RR-16460 from the IDeA Networks of Biomedical Research Excellence (INBRE) Program of the National Centre for Research Resources.