

# Huginn: Visualizing Wireless ns-2 Traces in 3D

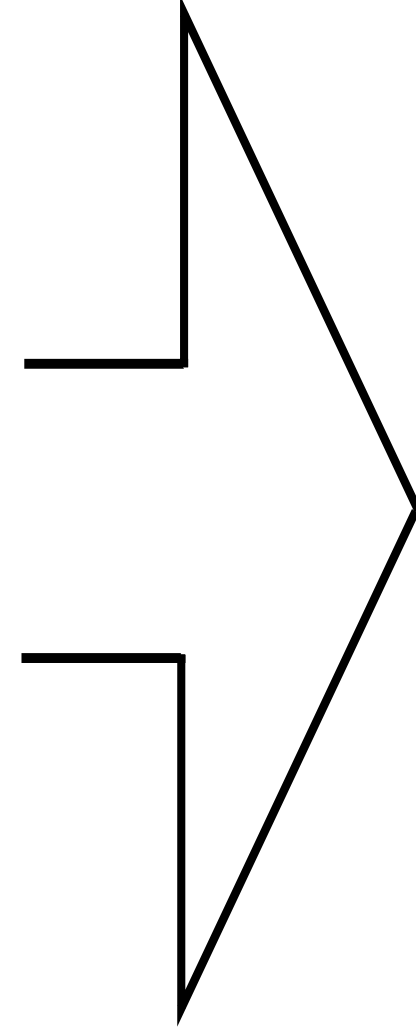
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## Trace File Visualization—Why?

- Network simulation is an important tool for MANET research
- But simulation traces are hard to read, e.g. four lines of ns-2 wireless trace:

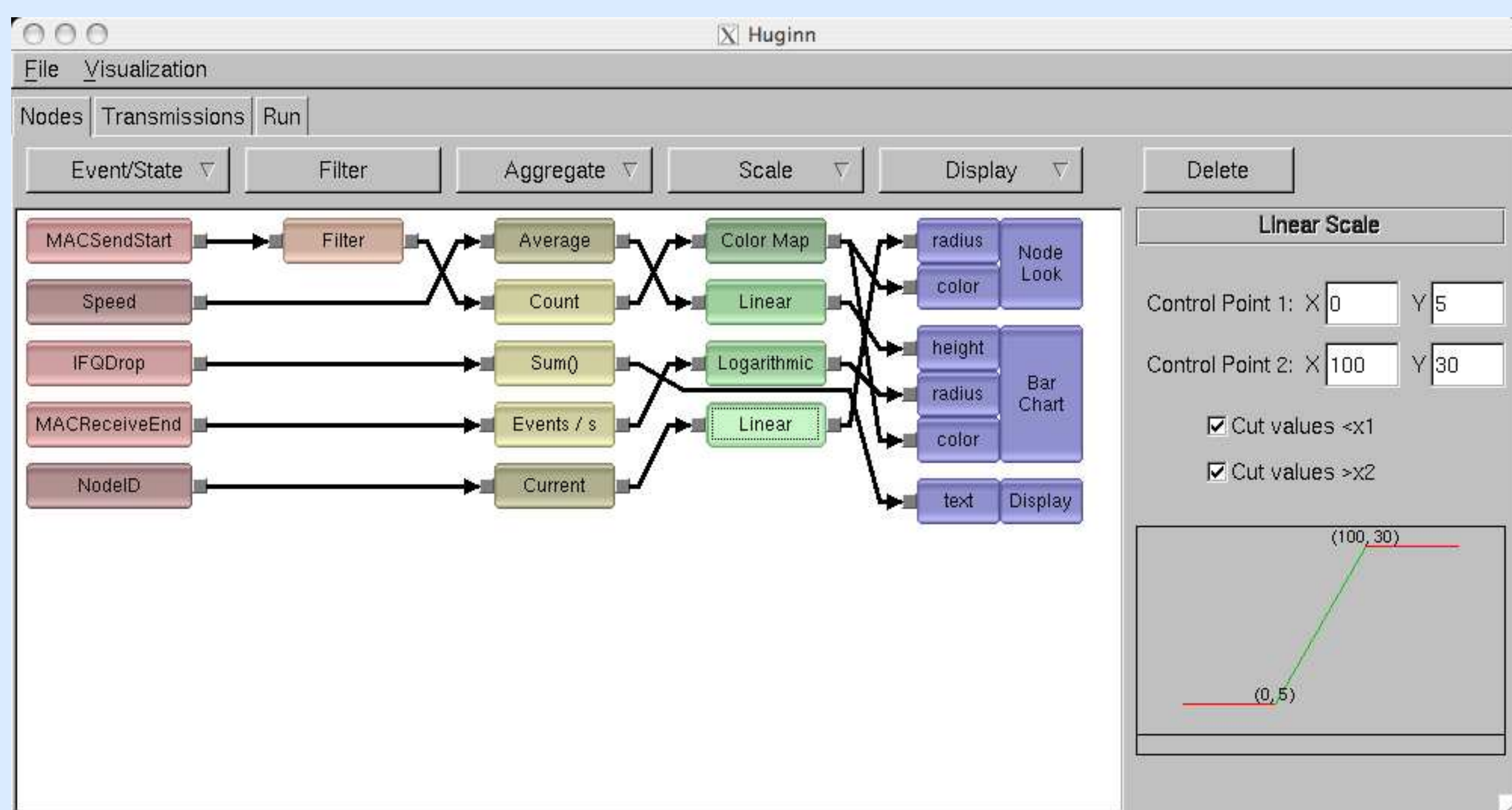
```
f -t 4.616909523 -Hs 24 -Hd 12 -Ni 24 -Nx 525.00 -Ny 525.00
-Nz 0.00 -Ne -1.000000 -Nl RTR -Nw --- -Ma 13a -Md 18 -Ms 19
-Mt 800 -Is 108.255 -Id 12.255 -It AODV -Il 44 -If 0 -Ii 0 -Iv 19
-P aodv -Pt 0x4 -Ph 12 -Pd 108 -Pds 6 -Pl 10.000000 -Pc REPLY
s -t 4.617628523 -Hs 24 -Hd -2 -Ni 24 -Nx 525.00 -Ny 525.00
-Nz 0.00 -Ne -1.000000 -Nl MAC -Nw --- -Ma 0 -Md ffffffff -Ms 18
-Mt 806 -P arp -Po REQUEST -Pms 24 -Ps 24 -Pmd 0 -Pd 12
r -t 4.618269106 -Hs 23 -Hd -2 -Ni 23 -Nx 525.00 -Ny 350.00
-Nz 0.00 -Ne -1.000000 -Nl MAC -Nw --- -Ma 0 -Md ffffffff -Ms 18
-Mt 806 -P arp -Po REQUEST -Pms 24 -Ps 24 -Pmd 0 -Pd 12
r -t 4.618269106 -Hs 13 -Hd -2 -Ni 13 -Nx 350.00 -Ny 525.00
-Nz 0.00 -Ne -1.000000 -Nl MAC -Nw --- -Ma 0 -Md ffffffff -Ms 18
-Mt 806 -P arp -Po REQUEST -Pms 24 -Ps 24 -Pmd 0 -Pd 12
```

- Result interpretation is tough, tedious and error-prone



Visualization helps to understand what happens in the simulation

## Flowchart Editor

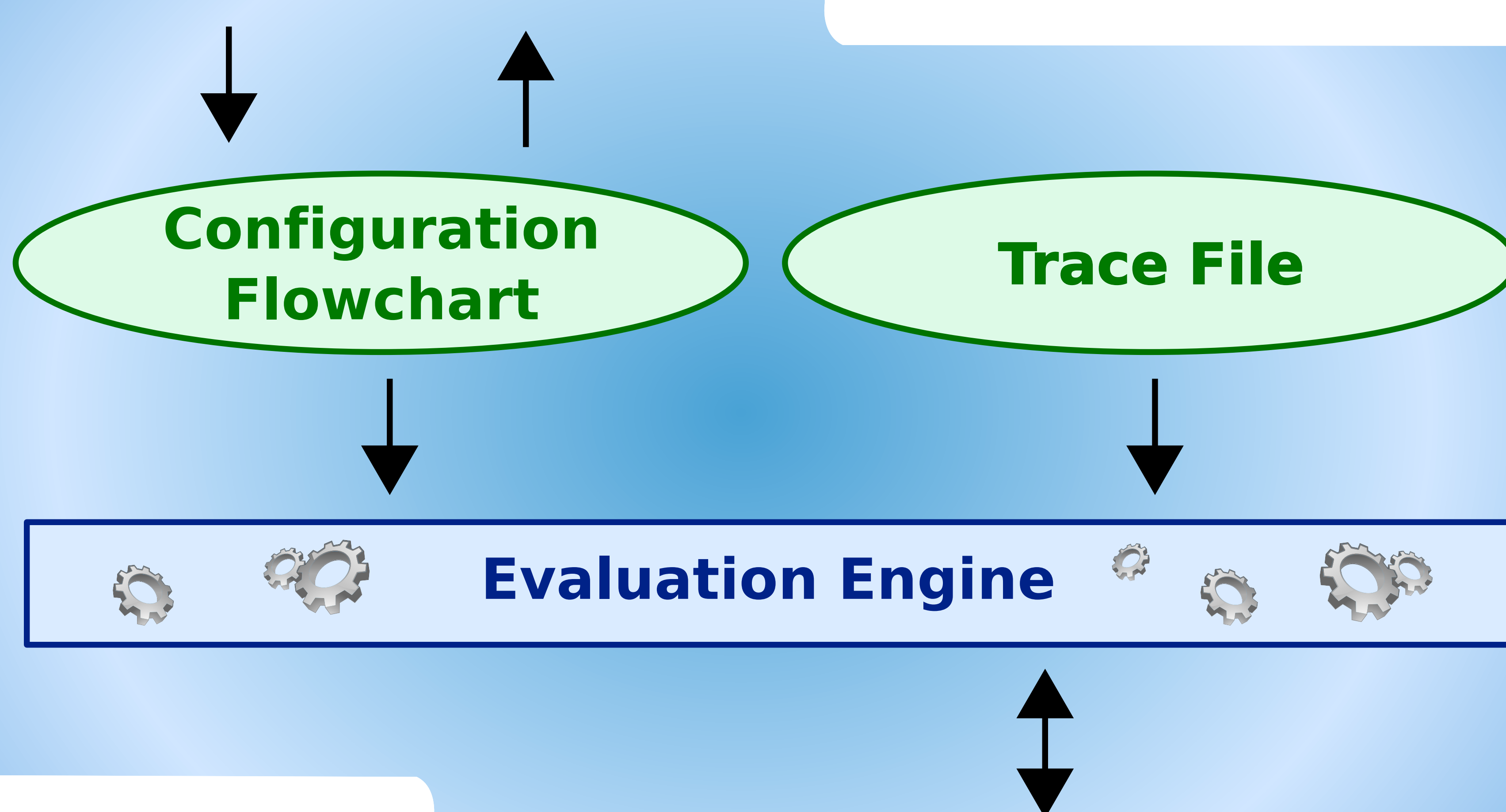


## Huginn's Approach

- Huginn visualizes wireless ns-2 traces in 3D
- Nodes and packet transmissions are visualized
- The third dimension is used to show additional data or statistics
- Configuration of the displayed data is done with a flowchart interface
- Huginn directly supports old and new ns-2 trace formats
- Main design goals: Ease of use and flexibility
- Modular software architecture

## Project Status

- Used in every-day work by several researchers
- Huginn is—usable—late beta
- Running under various Linux variants, e.g. Gentoo, Fedora Core, Novell/SuSE, Mandrake/Mandriva,...
- Pre-built and source packages are available



## Huginn References:

- [1] Huginn Homepage. <http://www.informatik.uni-mannheim.de/pi4/projects/Huginn/>
- [2] B. Scheuermann, H. Füßler, M. Transier, M. Busse, M. Mauve, W. Effelsberg. "Huginn: A 3D Visualizer for Wireless ns-2 Traces". To appear in: Proceedings of MSWiM 2005, October 10-13, 2005, Montréal, Québec, Canada.
- [3] B. Scheuermann, H. Füßler, M. Transier, M. Busse, M. Mauve, W. Effelsberg. "Huginn: A 3D Visualizer for Wireless ns-2 Traces". Technical Report TR-2005-005, University of Mannheim, June 2005.
- [4] B. Scheuermann. "Dreidimensionale Visualisierung von Simulationsdaten Mobiler Ad-Hoc-Netzwerke". Master's thesis, University of Mannheim, December 2004.

## Visualization Engine

