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# EXISTANCE OF EXTRA TERRESTRIAL USING BAYESIAN NETWORK WITH UTILITY AND DECISION NODES

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Applied Artificial Intelligence System Project-3

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Domain: Bayesian Network with Utility and decision nodes

## INDEX

#	Topic	Page no
1.	Abstract and Features	3
2.	Nodes and description	4
3.	Usage Manual	6
4.	Reference	7

## Abstract:

Existence of extra-terrestrial is a probabilistic interference system that assesses the probability of existence of extra-terrestrial life form based on the drake equation and factors that might support life on other planet.

## Features:

- The system computes the probability of existence of life form using the probability of existence of water, energy, nutrients and temperature<sup>[4]</sup> factors that contribute towards life on other planet.
- System is based on drake equation<sup>[1]</sup> to compute the probability of intelligent life forms using probability of discovery of new galaxy, stars and existence of intelligent life.
- The existence of intelligent life is based on the probability of parent nodes, discovery of planets that support life, discovery of stars that have planets and planets in which intelligent life actually exists.
- The system also gives decision : if the government funding should be increased or not based on the existence of ET using utility and decision nodes.

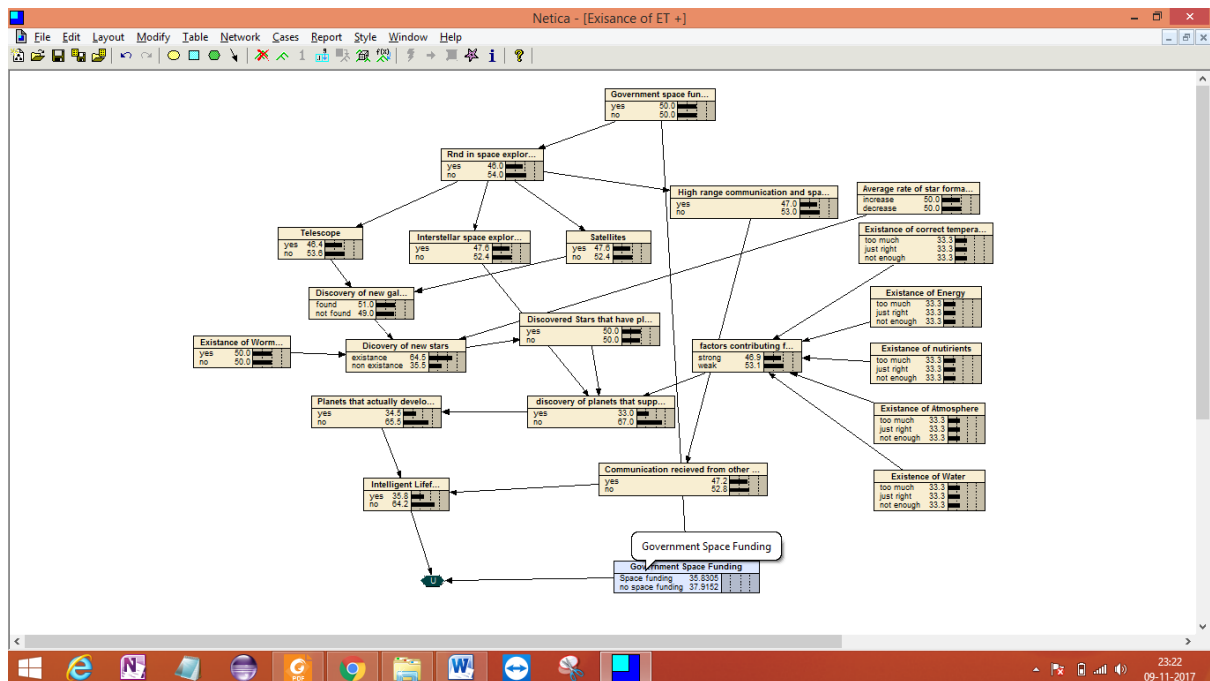
## Node and Description

#	Type of Node	Name	Description	References and links
1.	Nature Node	Government Space Funding	This node represents the probability that government gives funding in the space exploration	
2.	Nature Node	Rnd Space Exploration	This node represents the research and development in the space exploration provided the government funding	
3.	Nature Node	Telescope	It represents creation of new astronomical telescope eg: Hubble Telescope	
4.	Nature Node	Satellites	It represents artificial satellites built	
5.	Nature Node	High range communication and space GPS	It represents creation of new high range communication system eg like radio waves etc.	
6.	Nature node	Interstellar space exploration	It represents the interstellar space exploration, or spaceships that can find or explore new planets	
7.	Nature Nodes	Existence of temperature, energy, nutrients, water and atmosphere	These node are the fundamental elements that are required for existence of any form of life	
8.	Nature nodes	Factors contributing to life	It is an intermediately node for combining all the factors of life and computing the probability if its strong or weak. This affects the discovery of planets that support life	
9.	Decision node	Existence of wormhole	This is a decision node that represents the existence or nonexistence of wormhole that affects discovery of new stars	
10.	Nature node	Discovery of planets that support life	Planets that support life	<a href="#">Drake Equation</a>
11.	Nature node	Discovery of planets that actually develops life	Planets that actually end up developing life	<a href="#">Drake Equation</a>
12.	Nature node	Communication received from other life forms	This represent successful communication from other life forms using high range communication	<a href="#">Drake Equation</a>
13.	Nature node	Average rate of star formation	This represents the rate of star formation on the universe which keeps changing every year. It in turns affect the discovery of new stars.	<a href="#">Drake Equation</a>
14.	Nature node	Discovery of	This represents the stars that have	

		stars that have planets	planets as it would lead to development of life forms	
15.	Nature node	Discovery of new galaxy	This represents the discovery of new galaxies it act as an intermediate node for discovery of new stars	
16.	Nature Node	Intelligent life	Final node representing the probability of existence of intelligent life	<a href="#">Drake Equation</a>
17.	Decision Node	Government Space Funding	This decision node represents the decision if government should fund in space exploration or not (ie they fund in other areas like military, infrastructure etc.)	
18.	Utility Node	Expected utility for government space funding and existence of ET	Utility contains information of what course of action should is most preferred. It computes expected utility between existence of intelligent life forms and government space funding	

## Usage Manual:

Copy the file Existence of ET.neta in any location and open the file in Netica. Compile the network and input values by clicking on all the root nodes (node without parents) to see the changes flowing through the Bayesian Network.



## References:

- 1 [https://en.wikipedia.org/wiki/Drake\\_equation](https://en.wikipedia.org/wiki/Drake_equation)
- 2 <https://www.wired.com/2016/02/space-is-cold-vast-and-deadly-humans-will-explore-it-anyway/https://www.wired.com/2016/02/space-is-cold-vast-and-deadly-humans-will-explore-it-anyway/>
- 3 <http://adsabs.harvard.edu/abs/2014ebi..conf..2.1M>
- 4 [https://www.lpi.usra.edu/education/explore/our\\_place/hab\\_ref\\_table.pdf](https://www.lpi.usra.edu/education/explore/our_place/hab_ref_table.pdf)