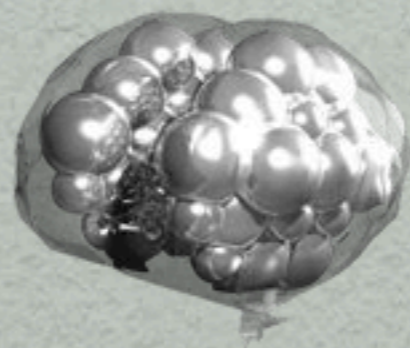
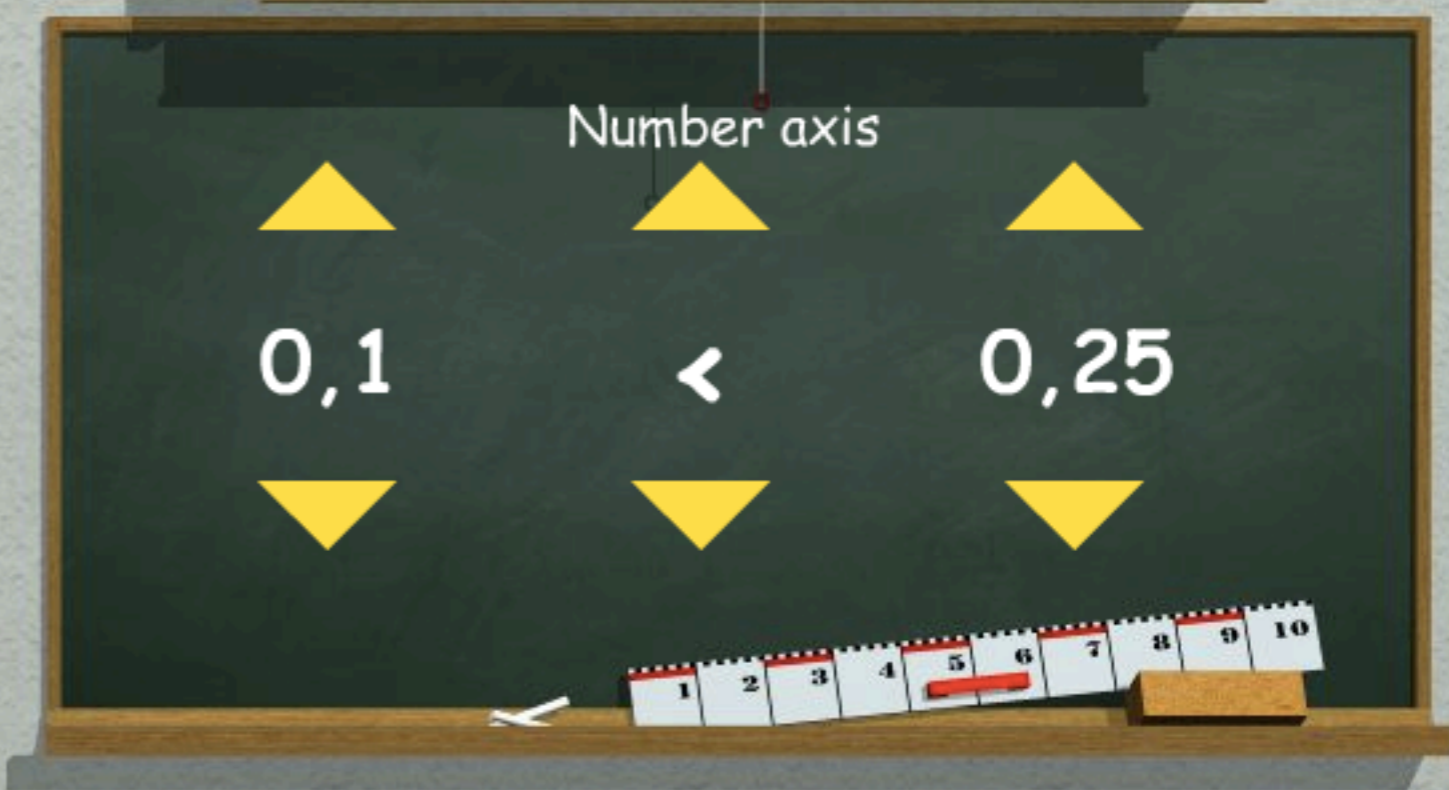
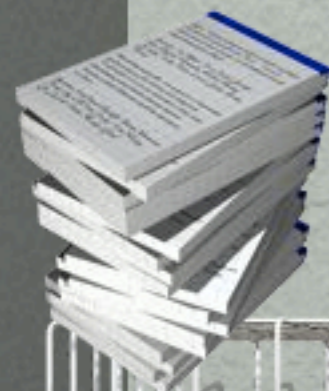
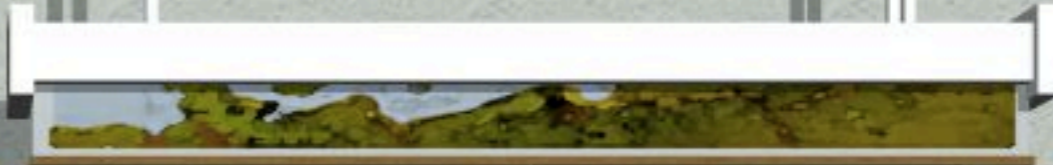




7



100



[Logout](#)

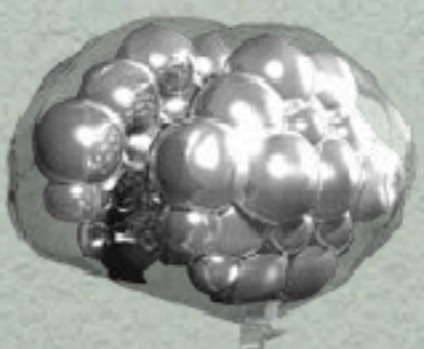
[Competition](#)

[Scoreboard](#)

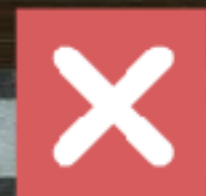
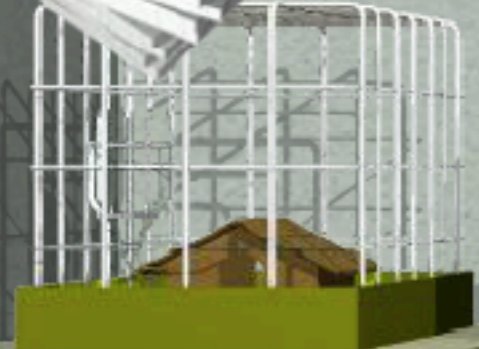
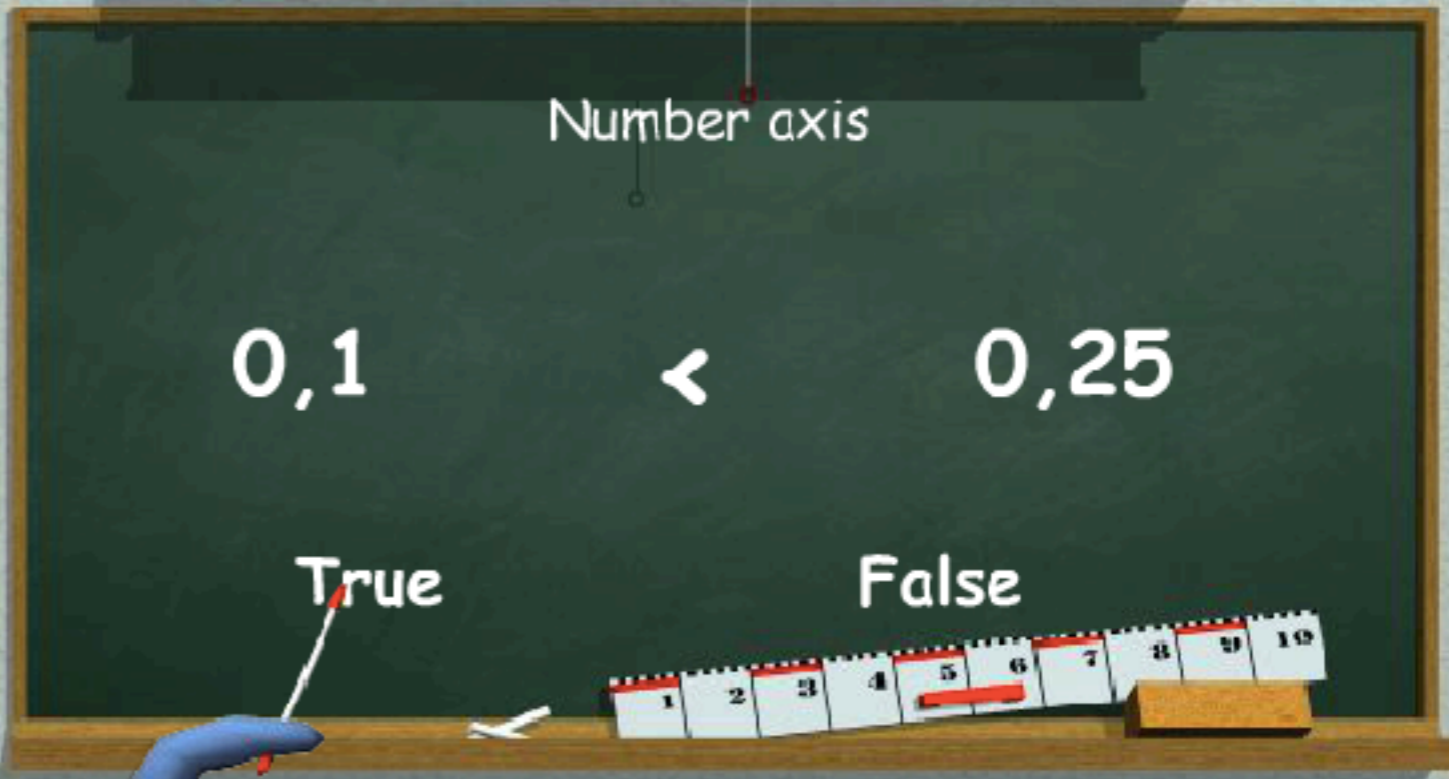
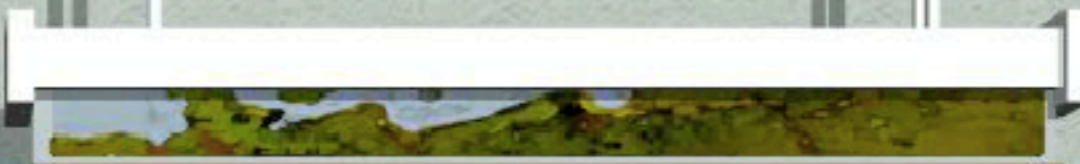
[Help](#)



7



100



4



Logout

Competition

Scoreboard

Help

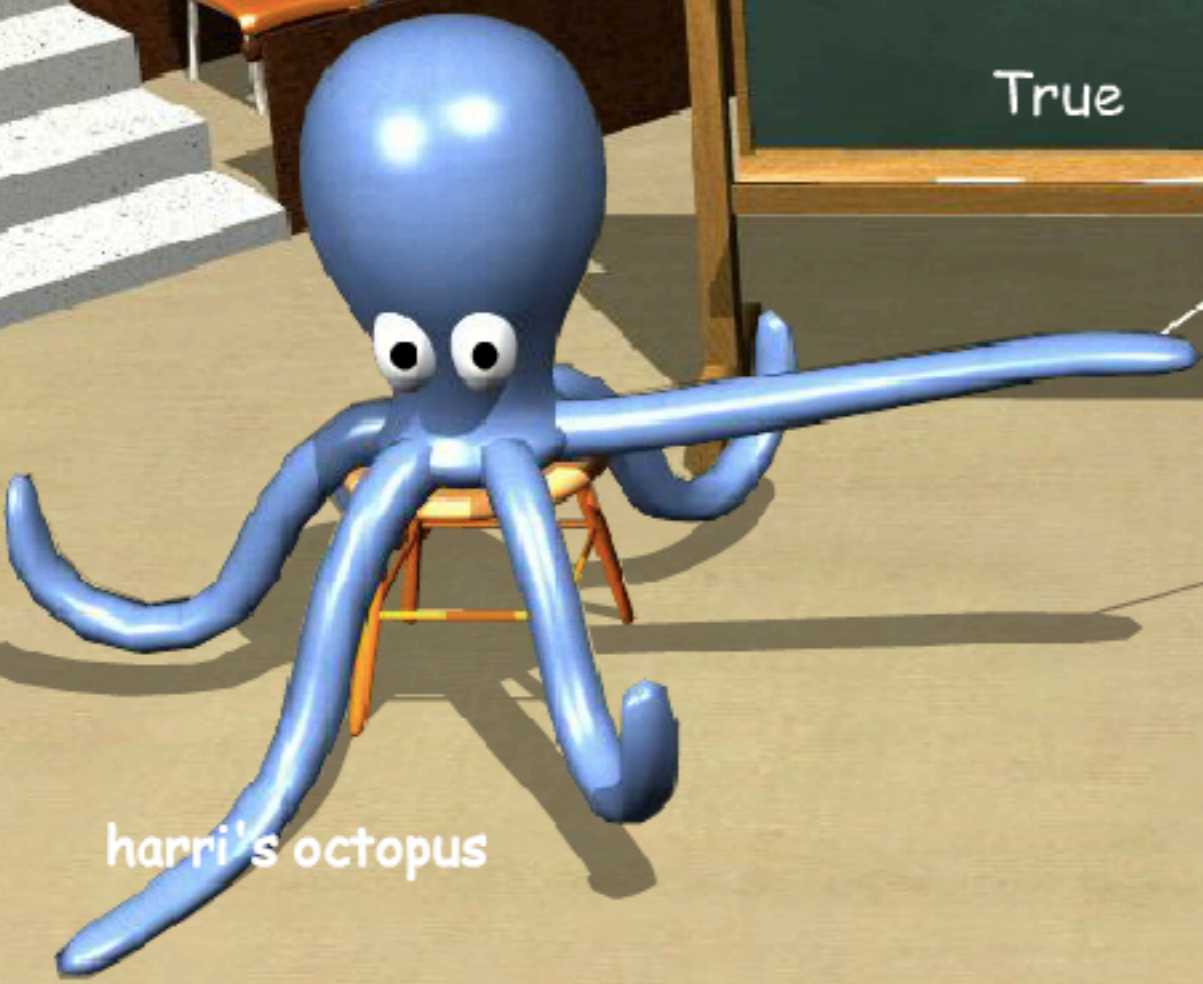
Animal class



Number axis

$$1 - 1$$
$$0,5 > 0,25 > \frac{2}{2}$$

True False



harri's octopus



wilppumestari's octopus





Agents and Analytics

A Framework for Educational Data Mining with Games Based Learning

Harri Ketamo^{1,2}

¹Satakunta University of Applied Sciences, Tiedepuisto 3, Pori, Finland

²Eedu Ltd, Satakunnankatu 23, Pori, Finland
harri.ketamo@eedu.fi

Keywords: Educational Data Mining, Learning Analytics, Games Based Learning, Artificial Intelligence

Abstract: This paper focuses on data mining and analysis framework behind Eedu elements mathematics game. The background of the game is in learning-by-doing, learning-by-teaching and to some extent learning-by-programming. The data modelling behind the game is based on semantic networks. When all the skills and knowledge is modelled as semantic network, all the data mining can be done in terms of network analysis. According to our studies, this approach enables very detailed and valid learning analytics. The novelty value of the study is in games based approach on learning and data mining.

1 INTRODUCTION

Experienced teachers are aware that when a pupil is asked to teach another pupil, both pupils learn. This fact has not been applied enough in educational games, mostly because of a lack of technology and game AI that enables players to teach conceptually challenging themes still remaining easy-to-use game play. Furthermore, we know that children are ready to do more work for their game characters that what they are ready to do for themselves. This goes also for learning.

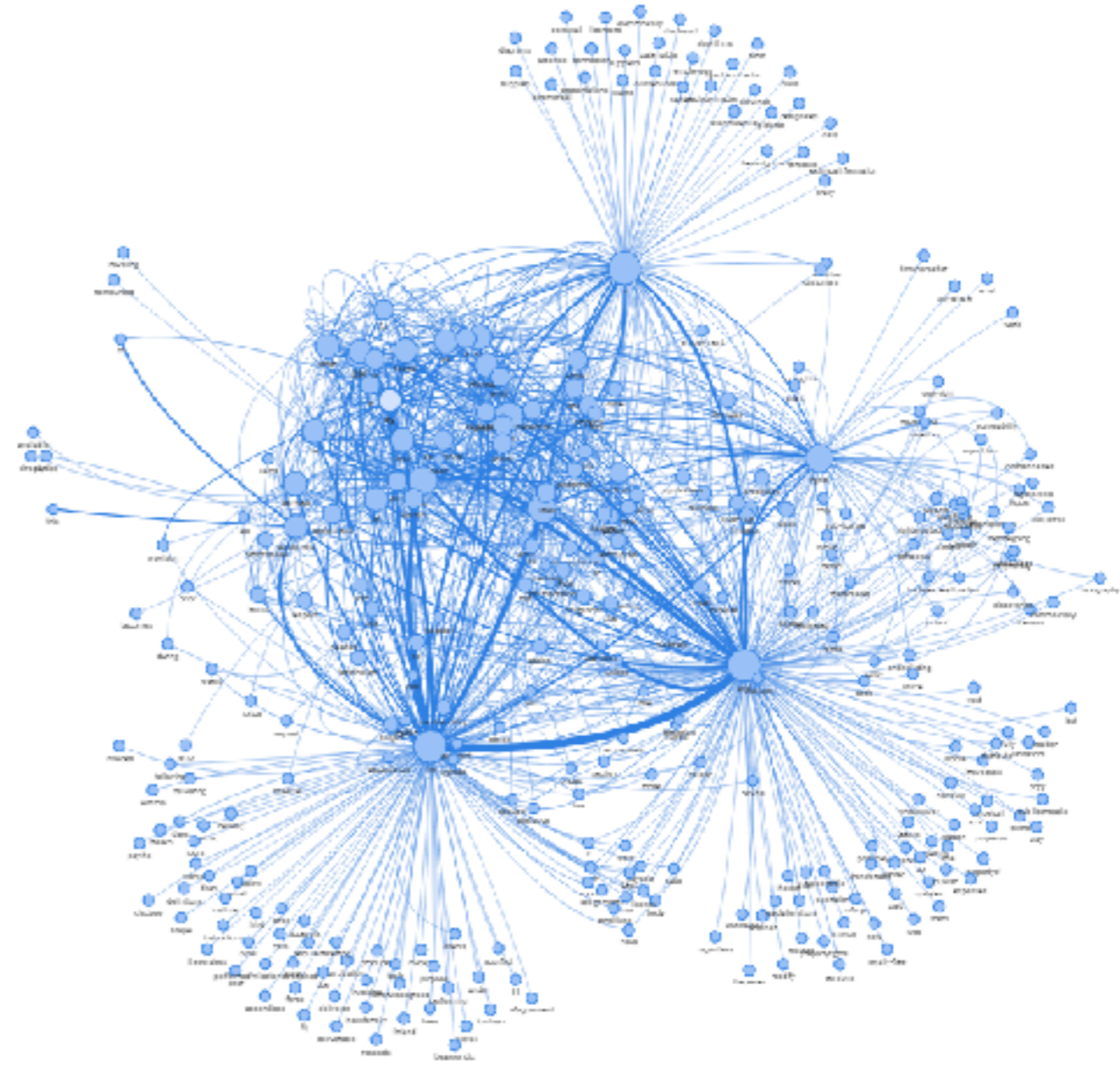
In terms of constructive psychology of learning, people actively construct their own knowledge through interaction with the environment and through reorganization of their mental structures. The key elements in learning are accommodation and assimilation. Accommodation describes an event when a learner figures out something radically new, which leads to a change in his/her mental conceptual structure. Assimilation describes events when a learner strengthens his/her mental conceptual structure by means of new relations (Mayer 2004).

In economical game theory (Shoham & Layton-Brown 2009) an agent behavior is widely studied in terms of Nash equilibrium. In this the agents are assumed to know the strategies of the other agents, and no agent has anything to gain by changing only its own strategy. A theory about existence of finite number of agents and their arbitrary relations based

on other agent (Dukovska & Percikova 2011) describes a set of attributes or properties that are useful when evaluating the agent behavior: 1) every agent is an entity, 2) every agent exists even it does not have a physical characteristics, 3) every agent chose to be in a state of direct knowledge with other agent according to its free will and 4) every agent is different from others in what it is.

Behavior modeling has a long research background: Neural and semantic networks, as well as genetic algorithms, are utilized to model a user's characteristics, profiles and pat-terns of behavior in order to support or challenge the performance of individuals. Behavior recording have been studied and used in the game industry for a good time. In all recent studies the level of behavior is limited, more or less, to observed patterns (e.g. Brusilovsky 2001; Houlette 2003). Furthermore, agent negotiation and it's scripted behavior (Kumar & Mastorakis 2010) as well as agent based information retrieval (Popirlan 2010) in web-based information systems has been studied for a long time.

In this study, user behavior, competence and learning were seen as Semantic (neural) network that produces self-organizing and adaptive behavior/interaction. The behavior is evaluated in terms of the theory about existence of finite number of agents. The AI technology developed, emulates the human way to learn: According to cognitive psychology of learning, our thinking is based on

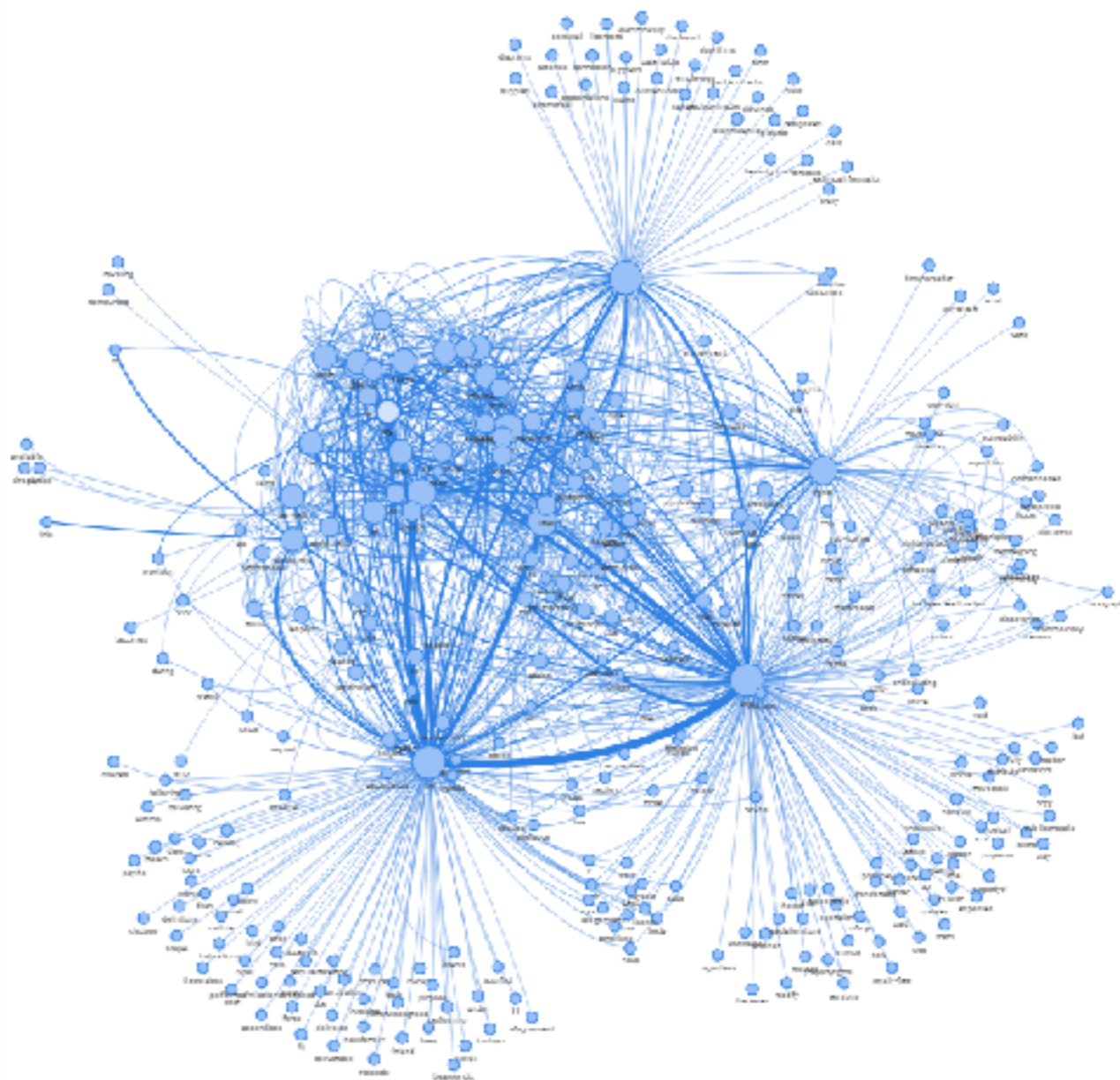




OPETUSHALLITUS
UTBILDINGSSTYRELSEN

LUKION OPETUSSUUNNITELMAN PERUSTEET 2015

Määräykset ja ohjeet 2015:48



artificial intelligence data cloud c... x



'World's worst drawer' stumps Google AutoDraw

BBC 2017-04-12 20:37:02.0
263195/265421



AI wins \$290,000 in Chinese poker tournament

BBC 2017-04-11 18:31:49.0
260893/265421



Artificial intelligence and drones 'future of policing'

BBC 2017-04-08 09:04:40.0
255134/265421



House intelligence panel tries to get Russia investigation back on track

CNN 2017-04-03 23:08:33.0
245530/265421



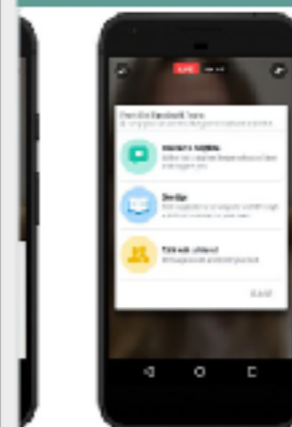
Elon Musk's next move: Merging brains and computers?

CNN 2017-03-28 17:30:47.0
234242/265421



Mnuchin: 'Not at all' worried about AI taking jobs

CNN 2017-03-25 02:02:02.0
220641/265421



Facebook artificial intelligence spots suicidal users

BBC 2017-03-01 15:17:36.0
192920/265421



Facebook algorithms 'will identify terrorists'

BBC 2017-02-17 08:15:26.0
179126/265421



AI program beats humans in poker game

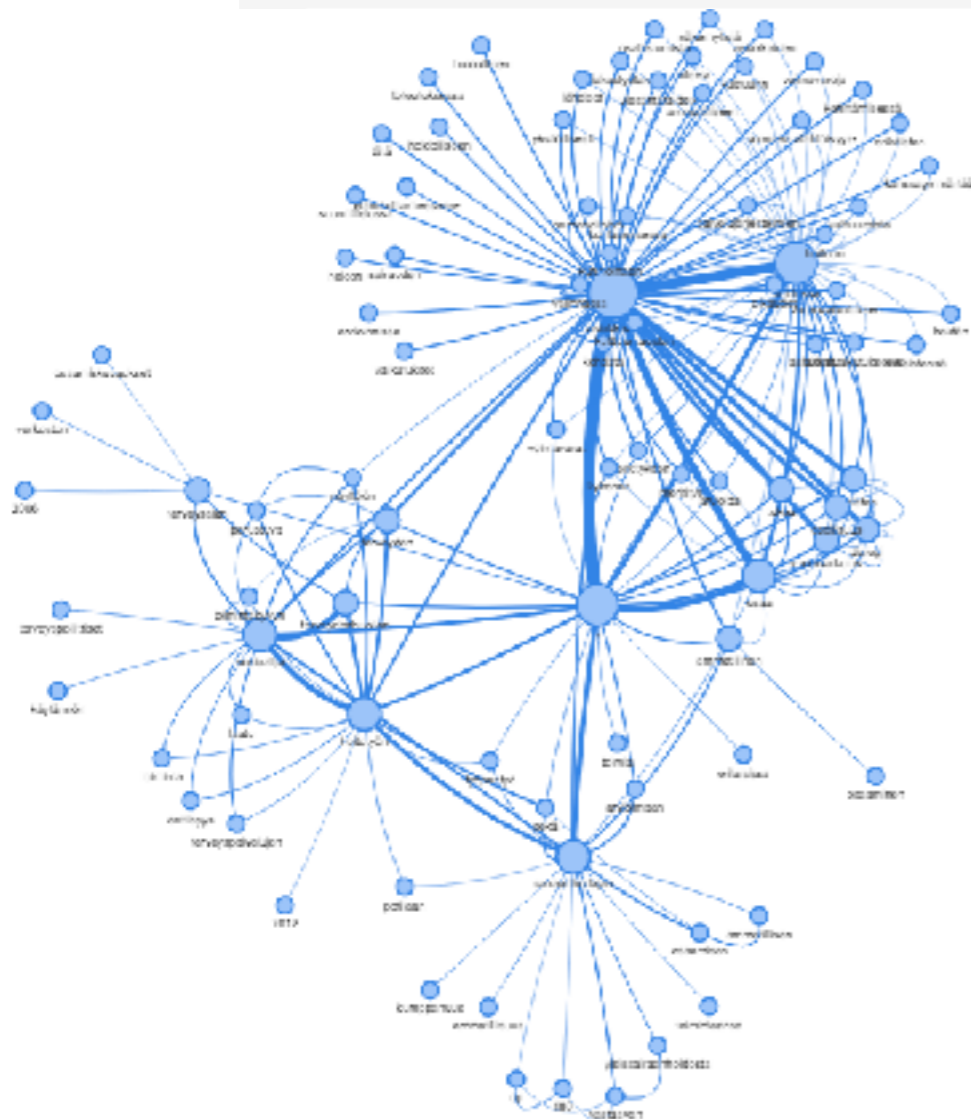
BBC 2017-01-31 21:20:43.0
159645/265421



Why scientists are debating the life span of robots







Local CDL-A Truck Driver in Salt Lake City, UT at Saia Lehi, UT 84043

Apply

Save Email

Details Highlights

TAKE A TURN FOR THE BEST

Local City Drivers can get started at a top rate of \$24.39/hr. with 2 years of experience

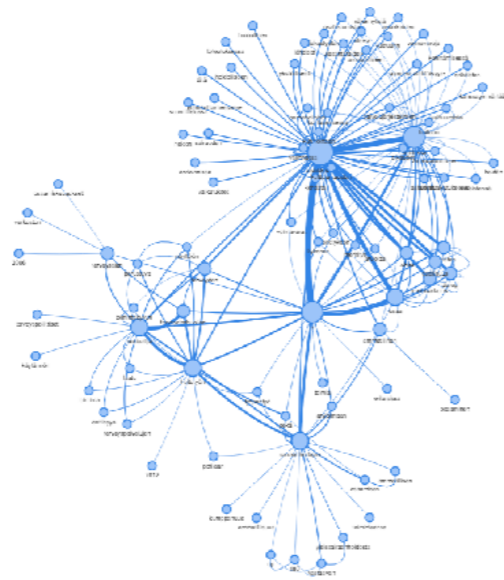
Ready to get started Just fill out this short form application. Once you complete it, a recruiter will call and we'll take care of all the rest.

Experience You Can Count On

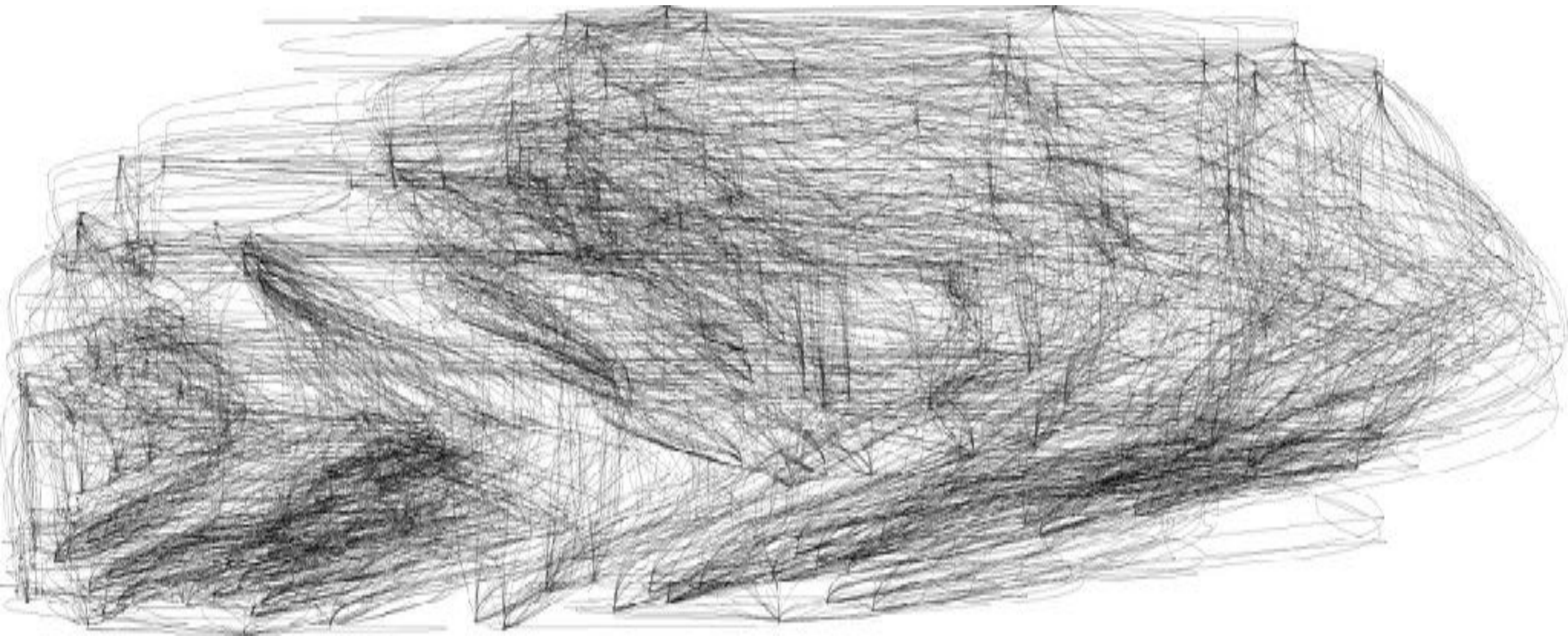
Family-owned founded in 1924, Saia has a long history of success. Our experience is what drives our leadership in providing complete transportation and logistics solutions. With the help of our service partners, our reach extends throughout the U.S. to Canada, Puerto Rico, and Mexico. That translates into numerous rewarding career opportunities for drivers seeking the thrill of a challenge with the stability of a leader. And with best-in-class benefits, top-industry pay, and regular home time, it's no wonder our team of over 9,000 employees choose a career with us. Discover your own path with Saia today.

Why Saia?

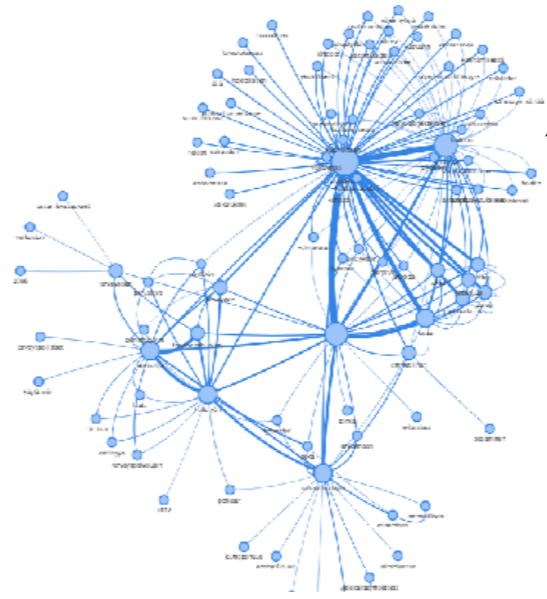
WE GO BEYOND SAYING WE CARE TO SHOWING YOU HOW MUCH.



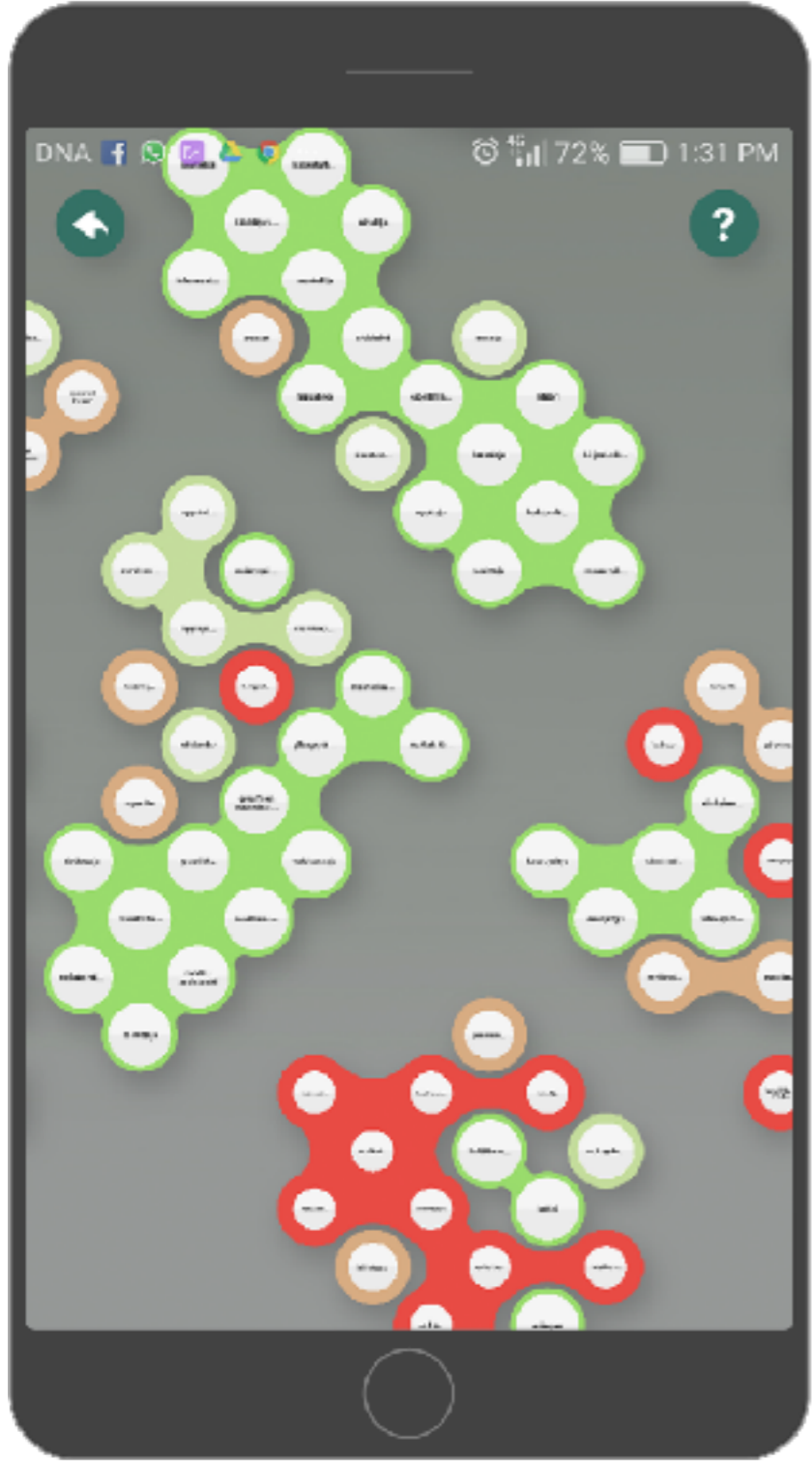
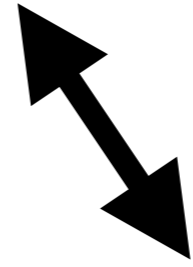
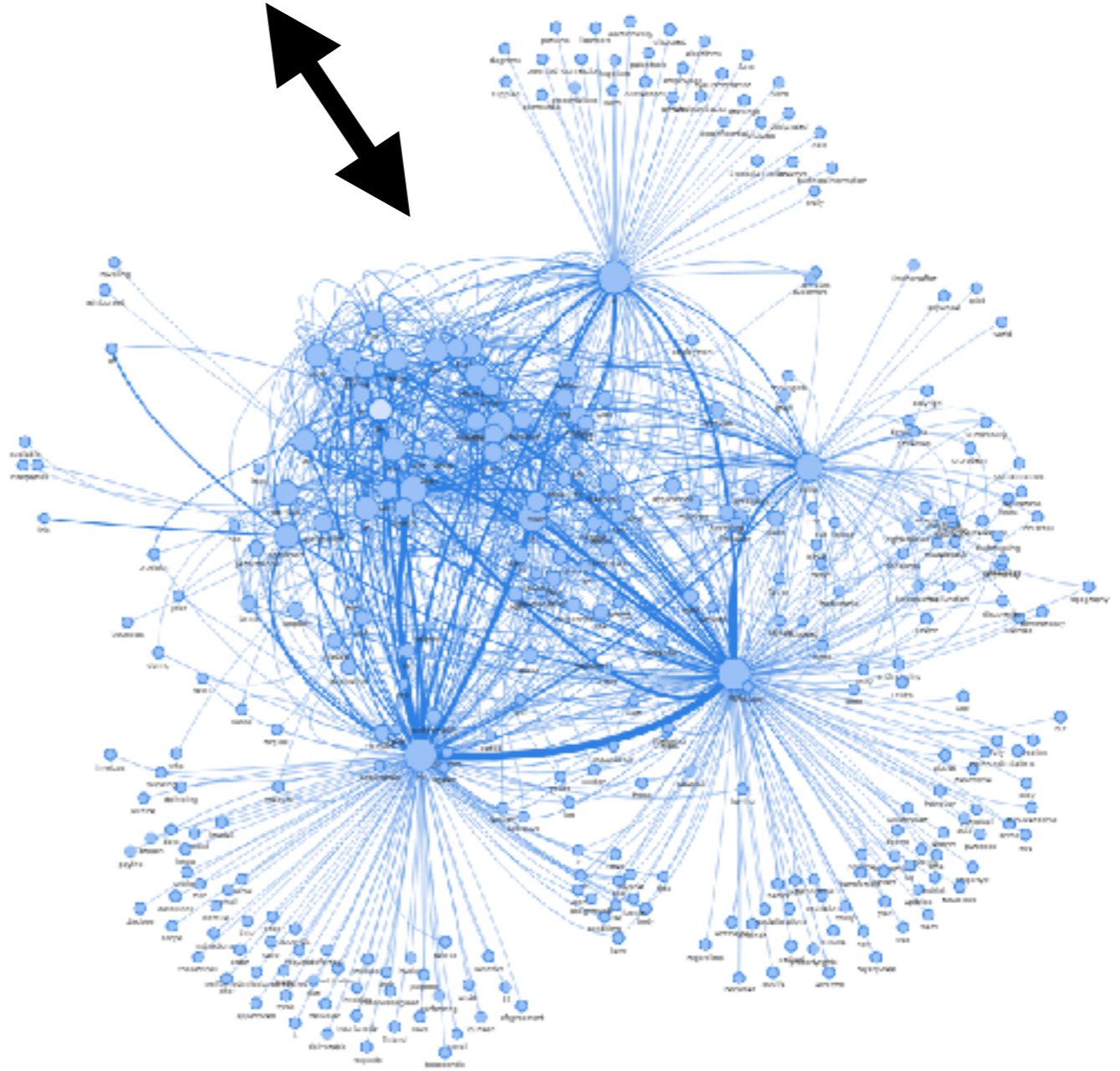
x 1 000



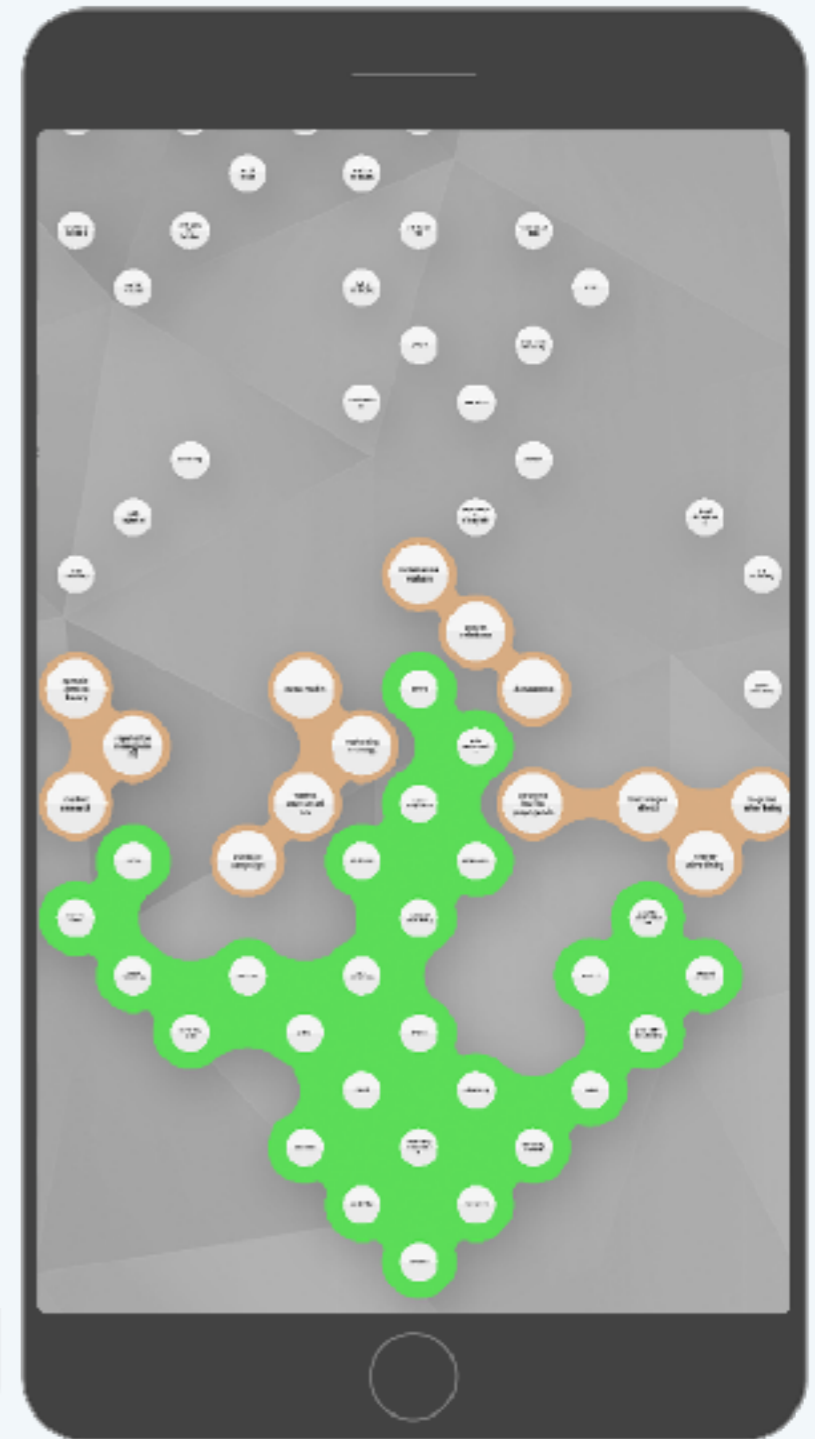
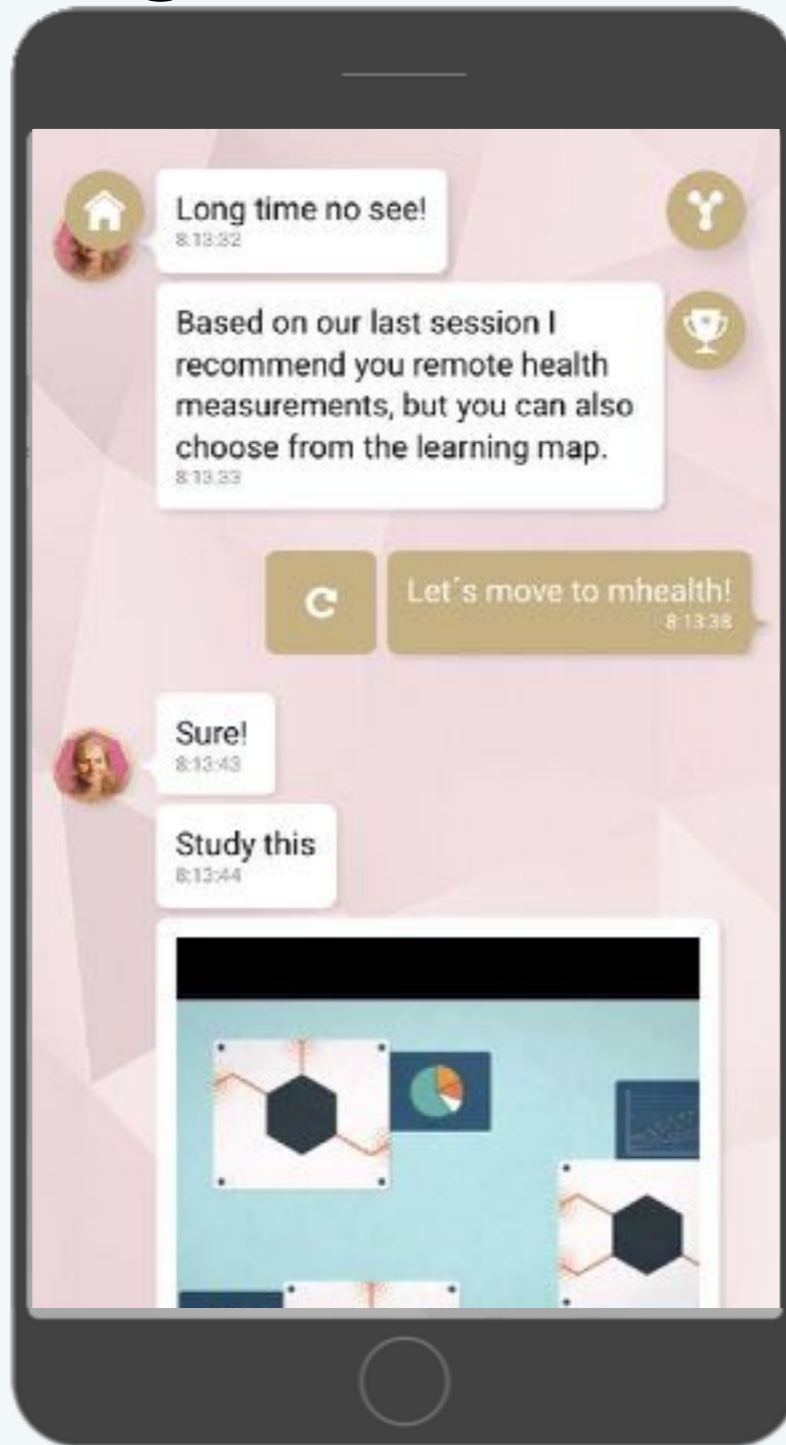
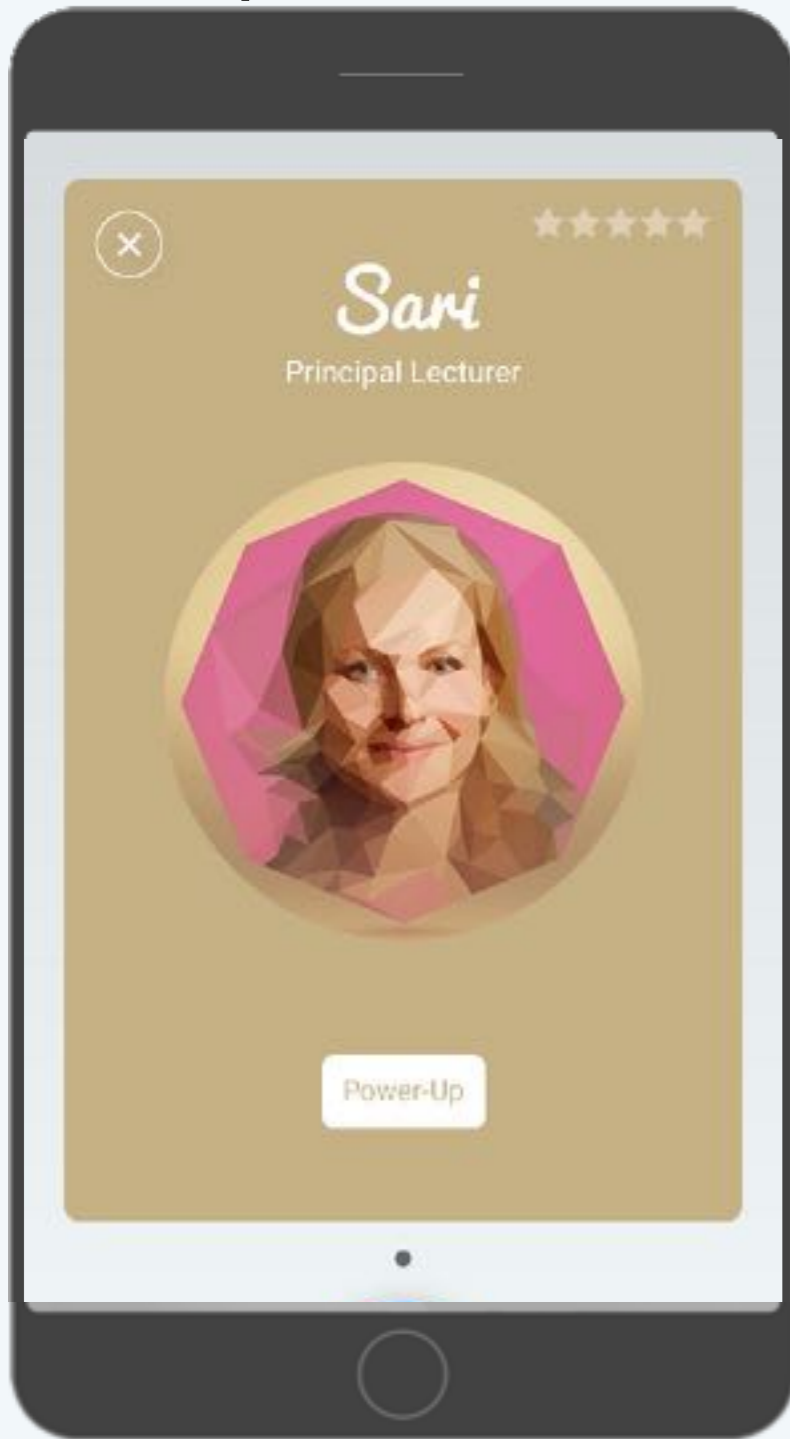
The image displays a heatmap grid representing data points across various categories. The grid is composed of approximately 30 columns and 30 rows of cells. Each cell contains a small numerical value, and the background color of each cell indicates its magnitude, following a color scale from light yellow (low values) to dark green (high values). The data is organized into several vertical sections, with the first section being the largest and most prominent. The values within the cells vary significantly, with some cells showing high values (dark green) and others showing low values (light yellow). The overall pattern suggests a complex distribution of data points across the different categories represented by the columns and rows.

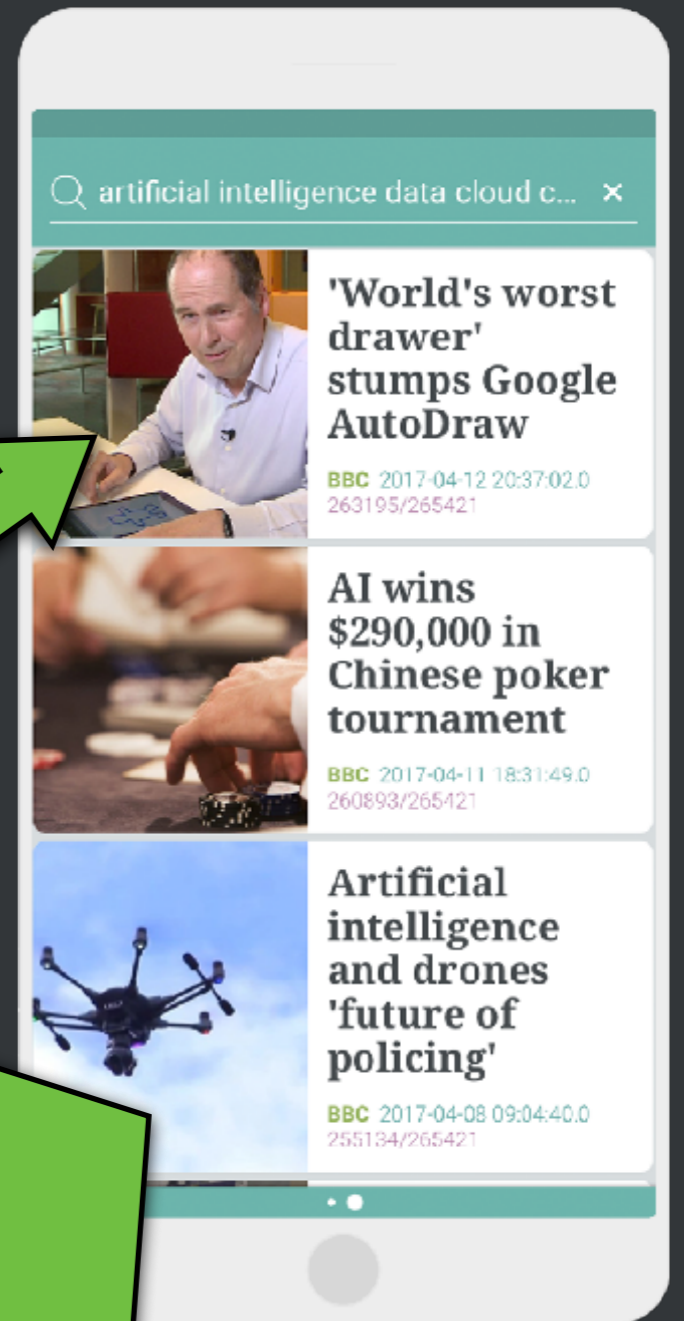
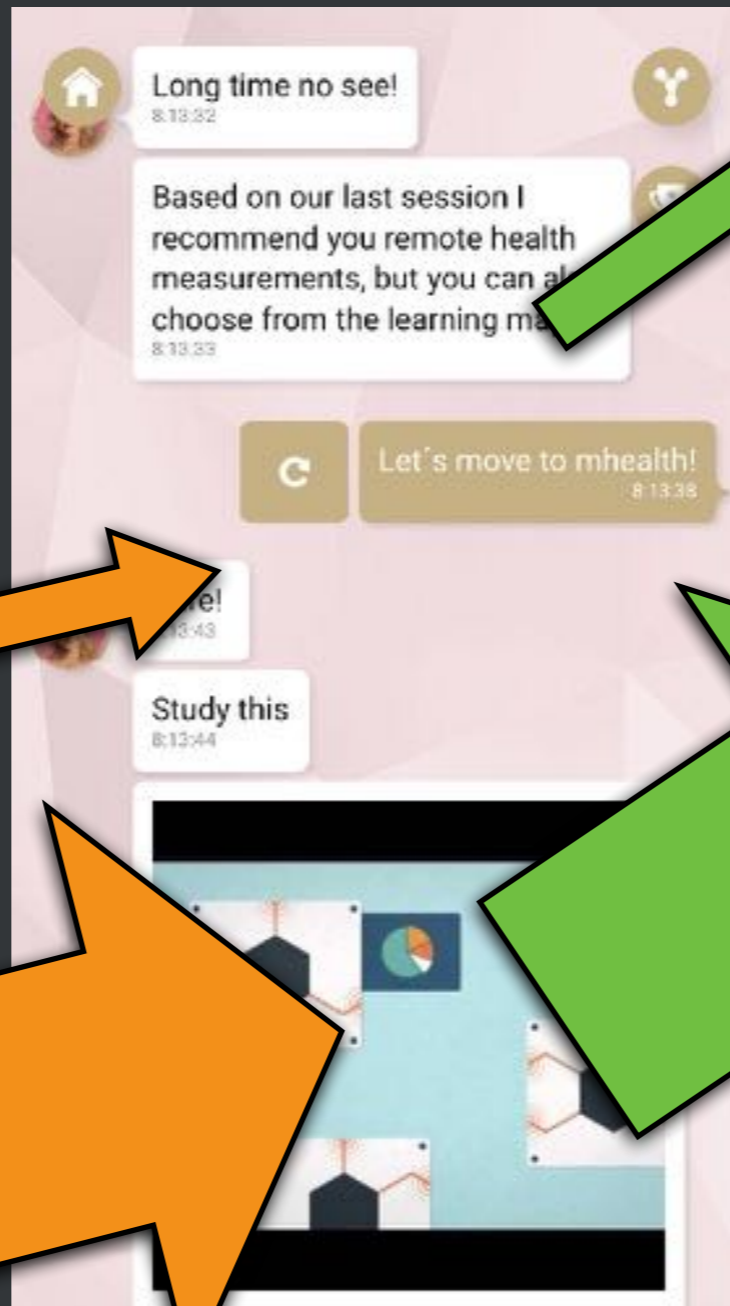
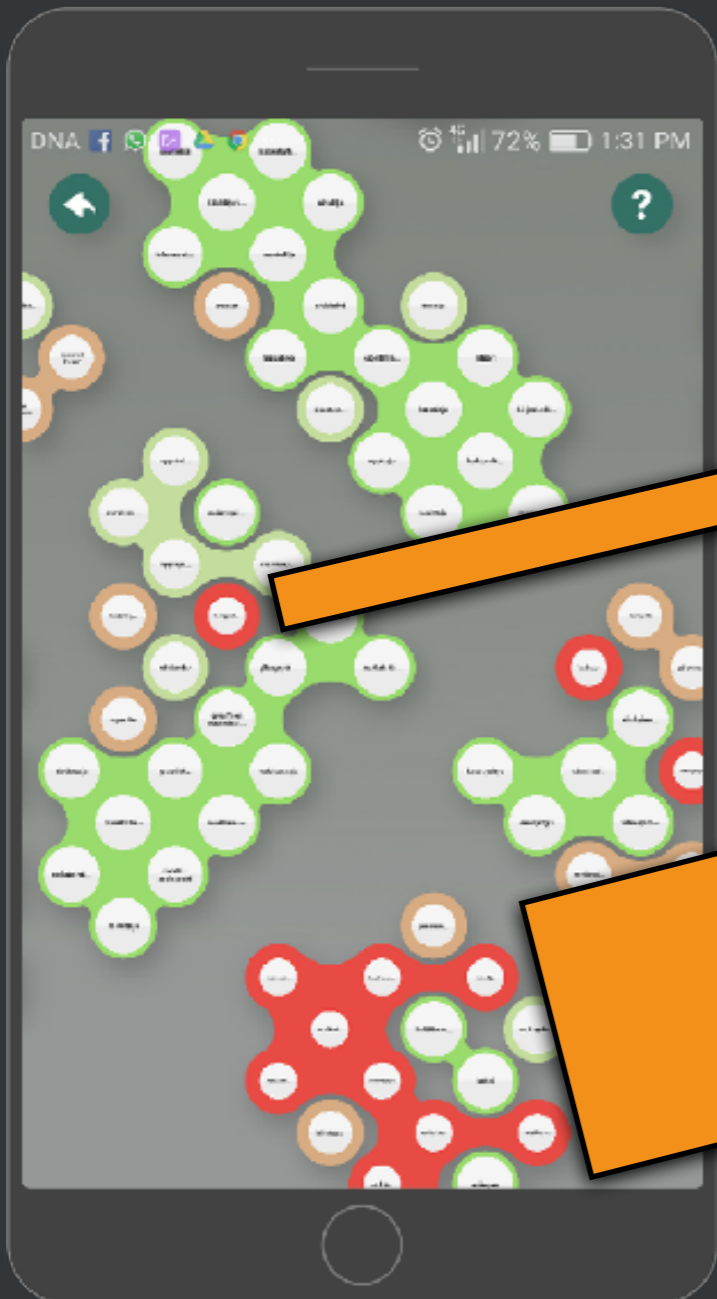


x 1 000 000



adaptive learning on demand






Input
ALL SOURCES

Output
JSON API

- online text**
www, social media
- offline text**
files, databases
- non-digital text**
ORC-plugin
- spoken words**
speech recognition
- images**
image content analysis
- ...



Headai
Deep Intelligence Platform
Cognitive, language aware
and language independent,
Artificial Intelligence.

- micro-learning
- competence mapping
- trends & weak signals
- categorization
- ontologies & keywords
- semantic matching
& clustering
- conversation
- ...

In commercial use

100% Headai IP

