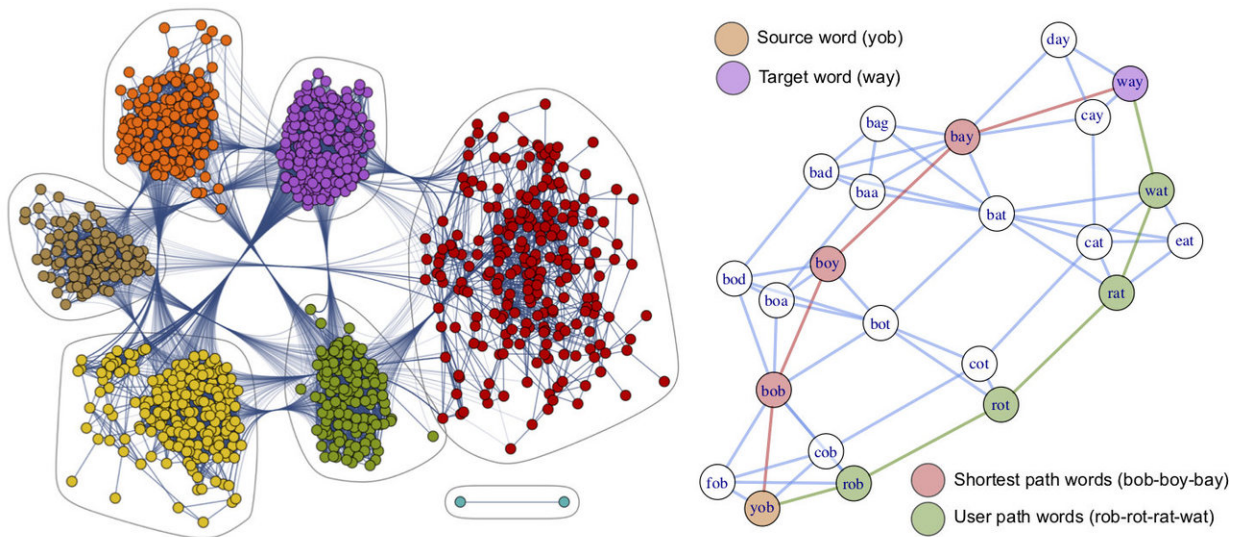


Open dataset of human navigation strategies in foreign networked systems

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The image to the left shows the whole word morph network in a clustered layout. The word morph network is a network of three- letter English words, in which two words are connected by a link if they differ only in a single letter. For example “FIT” is linked to “FAT” as they differ only in the middle letter, but “FIT” and “CAT” are not neighbours in this network since more than one letters differs in them. The network has a giant connected component and a small cluster containing only two nodes. The right image shows a word morph game example with source and target words “YOB” and “WAY”. A shortest path solution is displayed in red, while a solution given by a specific player is shown in green. Credit: Budapest University of Technology and Economics

Navigation within and across different types of information is an underlying process in performing many everyday tasks. Although human navigation is a natural part of life, the exploration of the underlying mechanisms is far from trivial. A structured scientific dataset has been offered by the computer scientist András Gulyás and his research team to investigate human navigation in foreign complex systems. "We have been doing research in navigability of complex networks, both technological and natural ones," says Dr. Gulyás, senior research fellow at Budapest University of Technology and Economics and the Hungarian Academy of Sciences, "and we felt we would need a smart database collecting analyzable data on human navigation."

The mathematician and Android software developer Attila Korosi had the idea to make a free [game](#) on the Android platform that would collect navigation data. We carefully designed and implemented the Android app. It is a word morph game called FIT-FAT-CAT," says Korosi. "The essence of this game is to find short routes between English three-letter words by changing only one letter per step, and, of course, through valid English words."

The research group member Dr. Marianna Sliz, linguist and cognitive scientist of Eotvos Science University of Budapest says, "The word morph games are a very special from human navigation, relying on words as elements of sentences, but the paths found by humans are fully independent from the meaning of the words, and even have no relation to meaningful sentences. Humans can navigate quickly and efficiently in their mental lexicon when speaking, for example, but playing this game requires a completely different navigation."

"We used this dataset in our investigations, but we think other researchers can also utilize it, which is why we put extra effort in making our database easily reachable," says Dr. Gulyas, and expresses the hope that the data can also inspire future collaborations. "According to our

previous study we already know that the routes produced by Fit Fat Cat players obey hierarchical selection rules, similarly to other complex systems like the internet or the structural networks of the human brain. We strongly believe that we and others could use this dataset to further explore the nature of human [navigation](#)," says Dr. Gulyás.

More information: Kőrösi, A. et al. A dataset on human navigation strategies in foreign networked systems. *Sci. Data* 5:180037 [DOI: 10.1038/sdata.2018.37](#) (2018)

Csoma, Attila, et al. "Routes Obey Hierarchy in Complex Networks." *Scientific Reports* 7.1 (2017): 7243. [DOI: 10.1038/s41598-017-07412-4](#)

Provided by Budapest University of Technology and Economics

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