

## 1 Summary to the general public

Random matrices serve as an indispensable tool when dealing with seemingly impossible problems of complex and strongly interacting systems. Nowadays it is an increasing problem since the amount of information we gather and are in need of processing is greater than ever. Therefore, we must develop new tools to navigate through this jungle. Current project is a mathematical framework useful in such applications. Although the eigenvectors seem to be an abstract object of linear algebra, perhaps the most astonishing example of using it is Google, the most popular search engine nowadays. Behind the success of this huge enterprise stands PageRank - an ingenious searching algorithm. It forms a map of the internet following all hyperlinks, encodes it in a special matrix and search results are the special eigenvector of this matrix. When it comes to non-hermitian matrices which are the main subject of current research perhaps the most astonishing area of research is in simple models of the brain. Neurons are basic building block which are known to behave truly non-symmetrically. When conducting signals, they work only one-way, a feature which is exactly translated into lack of hermiticity in the underlying matrix. To sum up, behind beautiful mathematical ideas there are often equally profound applications in the real world around us.