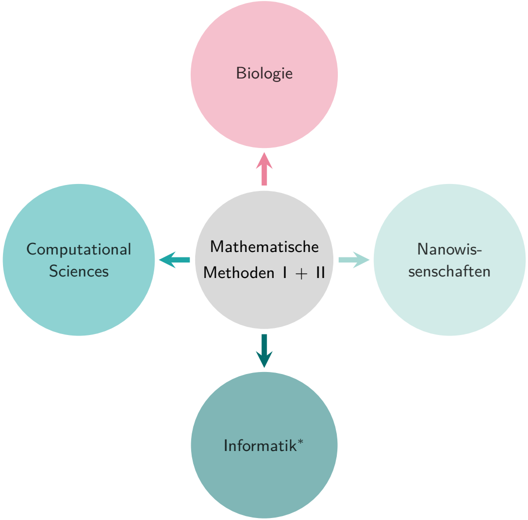
Universität Basel

Drehscheibe-Event 2023: Mathematik

Prof. Dr. Philipp Habegger, 20. April, 2023

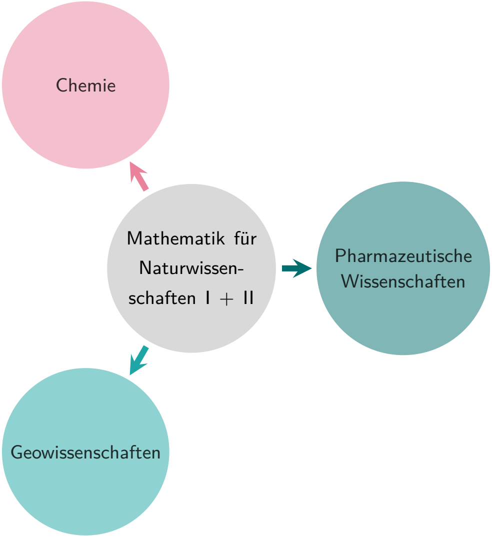
Studium

Philosophisch-Naturwissenschaftliche Fakultät



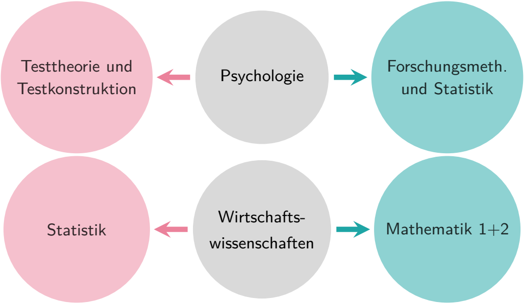
Dozentin: PD Dr. Annette A'Campo-Neuen

Philosophisch-Naturwissenschaftliche Fakultät



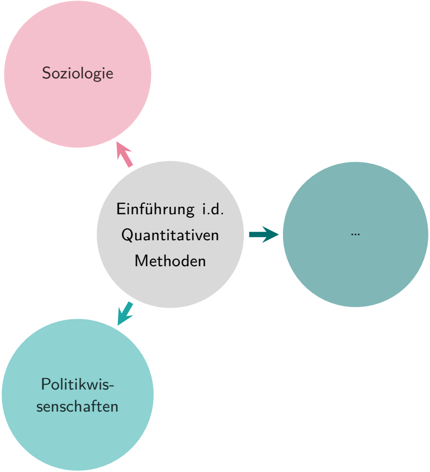
Dozentin: Dr. Christine Zehrt

Psychologie und Wirtschaftswissenschaften



Dozenten: Dr. Martin Steppan, Dr. Thomas Zehrt, et. al.

Philosophisch-Historische Fakultät



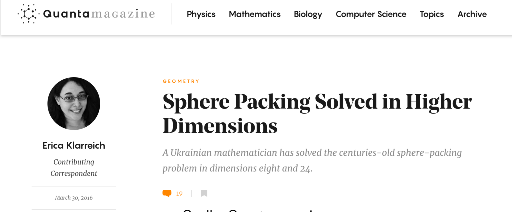
Dozentin: Prof. Dr. Denise Traber

Mathematik

Quelle: Maryna Viazovska

Maryna Viazovska:
2022 Fields-Medaille

Quelle: Stefan Zachow



Quantamagazine | Physics | Mathematics | Biology | Computer Science | Topics | Archive

Erica Klarreich
Contributing Correspondent
March 30, 2016

GEOMETRY

Sphere Packing Solved in Higher Dimensions

A Ukrainian mathematician has solved the centuries-old sphere-packing problem in dimensions eight and 24.

19

Quelle: Quantamagazine

Quelle: Antoine Nectoux
(Klein Project Blog)

Wieso interessieren uns “hochdimensionale” Räume?

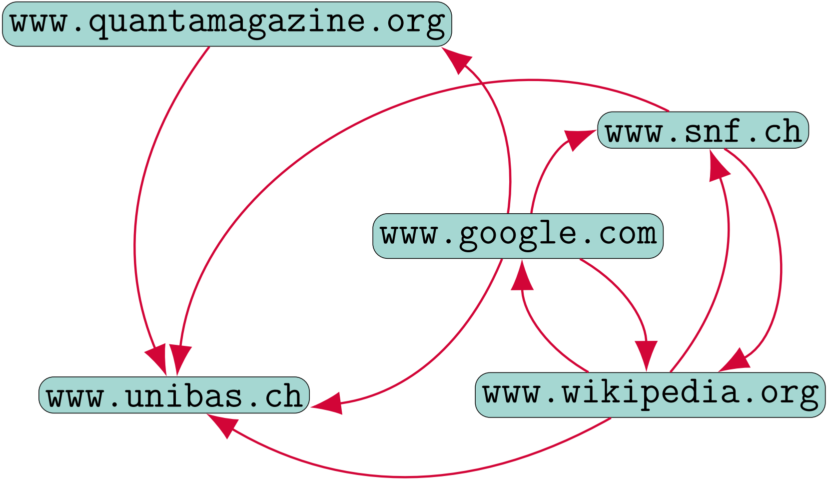
Quelle: Steve Jurvetson (wikipedia)

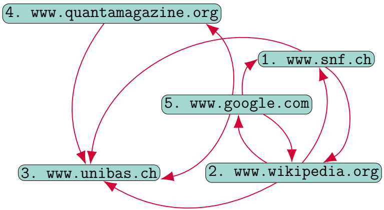
Sergey Brin

Quelle: Stansfield PL (wikipedia)

Larry Page

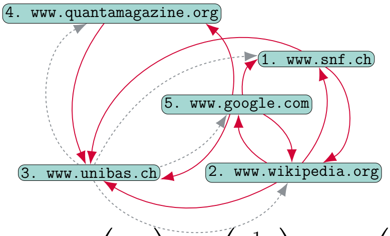
Surfen auf dem Internet als Markov-Prozess





$$A = \begin{pmatrix} 0 & \frac{1}{3} & \frac{1}{4} & 0 & \frac{1}{4} \\ \frac{1}{2} & 0 & \frac{1}{4} & 0 & \frac{1}{4} \\ \frac{1}{2} & \frac{1}{3} & 0 & 1 & \frac{1}{4} \\ 0 & 0 & \frac{1}{4} & 0 & \frac{1}{4} \\ 0 & \frac{1}{3} & \frac{1}{4} & 0 & 0 \end{pmatrix}$$

$$A \rightsquigarrow A \begin{pmatrix} 0 \\ 0 \\ 0 \\ 0 \\ 1 \end{pmatrix} = \begin{pmatrix} \frac{1}{4} \\ \frac{1}{4} \\ \frac{1}{4} \\ \frac{1}{4} \\ 0 \end{pmatrix} \rightsquigarrow A \begin{pmatrix} \frac{1}{4} \\ \frac{1}{4} \\ \frac{1}{4} \\ \frac{1}{4} \\ 0 \end{pmatrix} = A^2 \begin{pmatrix} 0 \\ 0 \\ 0 \\ 0 \\ 1 \end{pmatrix} = \begin{pmatrix} 0{,}14\ldots \\ 0{,}18\ldots \\ 0{,}45\ldots \\ 0{,}06\ldots \\ 0{,}14\ldots \end{pmatrix}$$



$$A = \begin{pmatrix} 0 & \frac{1}{3} & \frac{1}{4} & 0 & \frac{1}{4} \\ \frac{1}{2} & 0 & \frac{1}{4} & 0 & \frac{1}{4} \\ \frac{1}{2} & \frac{1}{3} & 0 & 1 & \frac{1}{4} \\ 0 & 0 & \frac{1}{4} & 0 & \frac{1}{4} \\ 0 & \frac{1}{3} & \frac{1}{4} & 0 & 0 \end{pmatrix}$$

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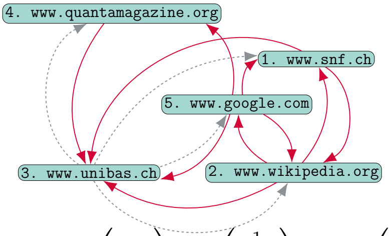

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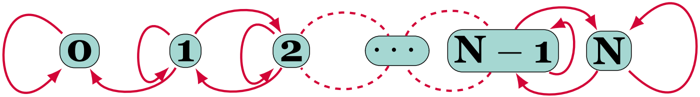
$$A \rightsquigarrow A \begin{pmatrix} 0 \\ 0 \\ 0 \\ 0 \\ 1 \end{pmatrix} = \begin{pmatrix} \frac{1}{4} \\ \frac{1}{4} \\ \frac{1}{4} \\ \frac{1}{4} \\ 0 \end{pmatrix} \rightsquigarrow A \begin{pmatrix} \frac{1}{4} \\ \frac{1}{4} \\ \frac{1}{4} \\ \frac{1}{4} \\ 0 \end{pmatrix} = A^2 \begin{pmatrix} 0 \\ 0 \\ 0 \\ 0 \\ 1 \end{pmatrix} = \begin{pmatrix} 0{,}14\ldots \\ 0{,}18\ldots \\ 0{,}45\ldots \\ 0{,}06\ldots \\ 0{,}14\ldots \end{pmatrix}$$

Nach 1000 Schritten: $\begin{pmatrix} 0{,}19\ldots \\ 0{,}21\ldots \\ 0{,}32\ldots \\ 0{,}11\ldots \\ 0{,}15\ldots \end{pmatrix}$

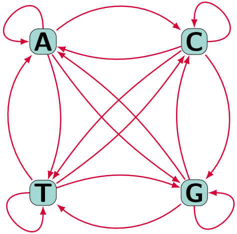
(1) unibas.ch
(2) wikipedia.org
(3) snf.ch
(4) google.com
(5) quantamagazine.org

Markov-Prozess und Naturwissenschaften

SIS-Modell in der Epidemiologie “Susceptible (S) individuals become infected (I), do not develop immunity”



Subsitution von Nukleinbasen



Universität Basel

Vielen Dank
für Ihre Aufmerksamkeit.

Eine Runde Pizza hat Radius z und der Belag hat Höhe a. Was ist das Volumen und wieso ist das witzig?

(A) $\pi \; zz \; a$

(B)