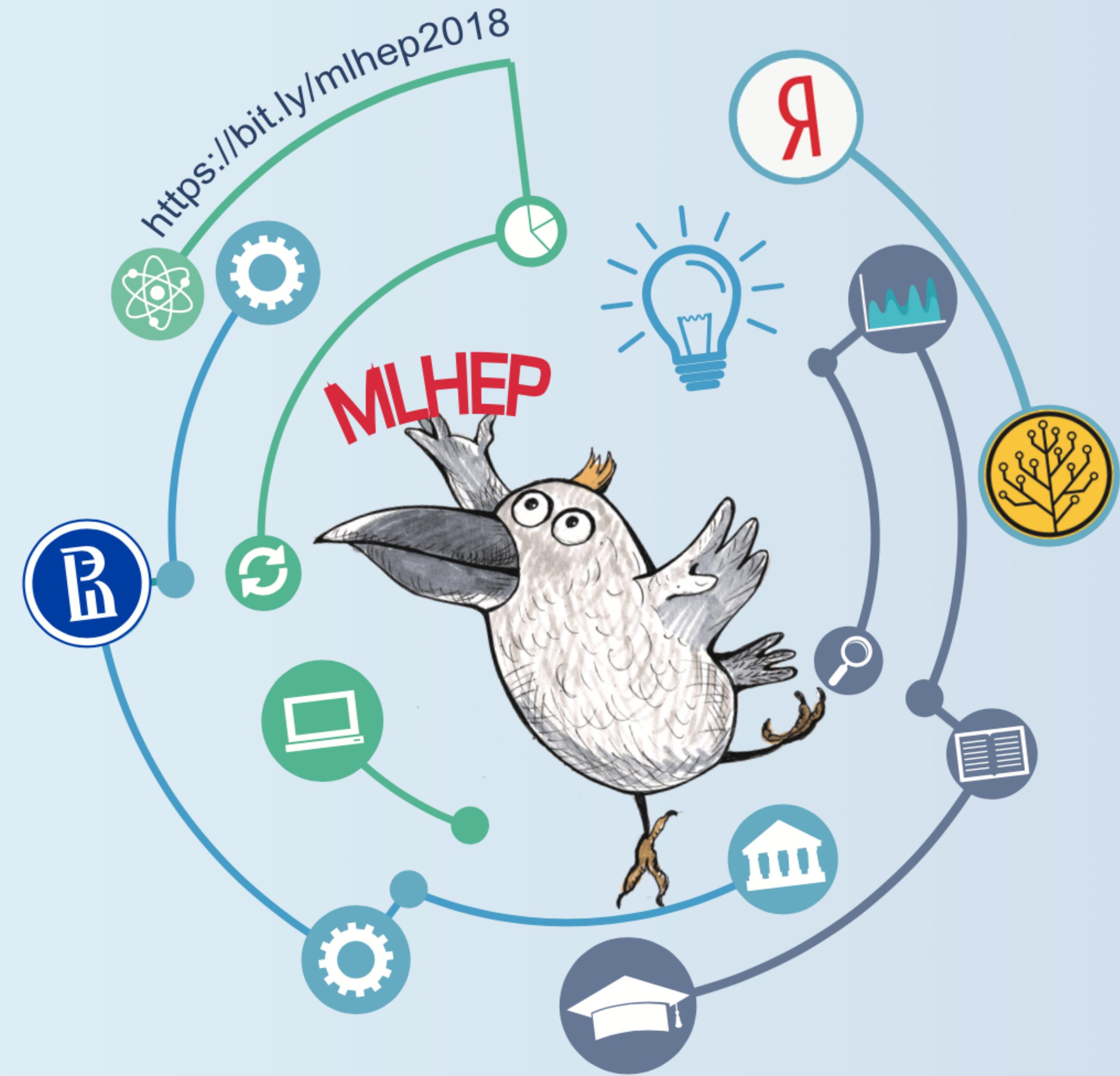




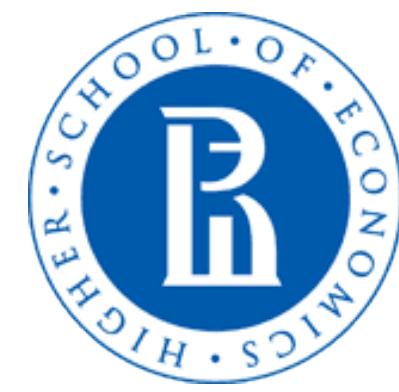
UNIVERSITY OF  
OXFORD



Yandex



SCHOOL OF DATA ANALYSIS



# Welcome to MLHEP!

2018-08-06, Oxford

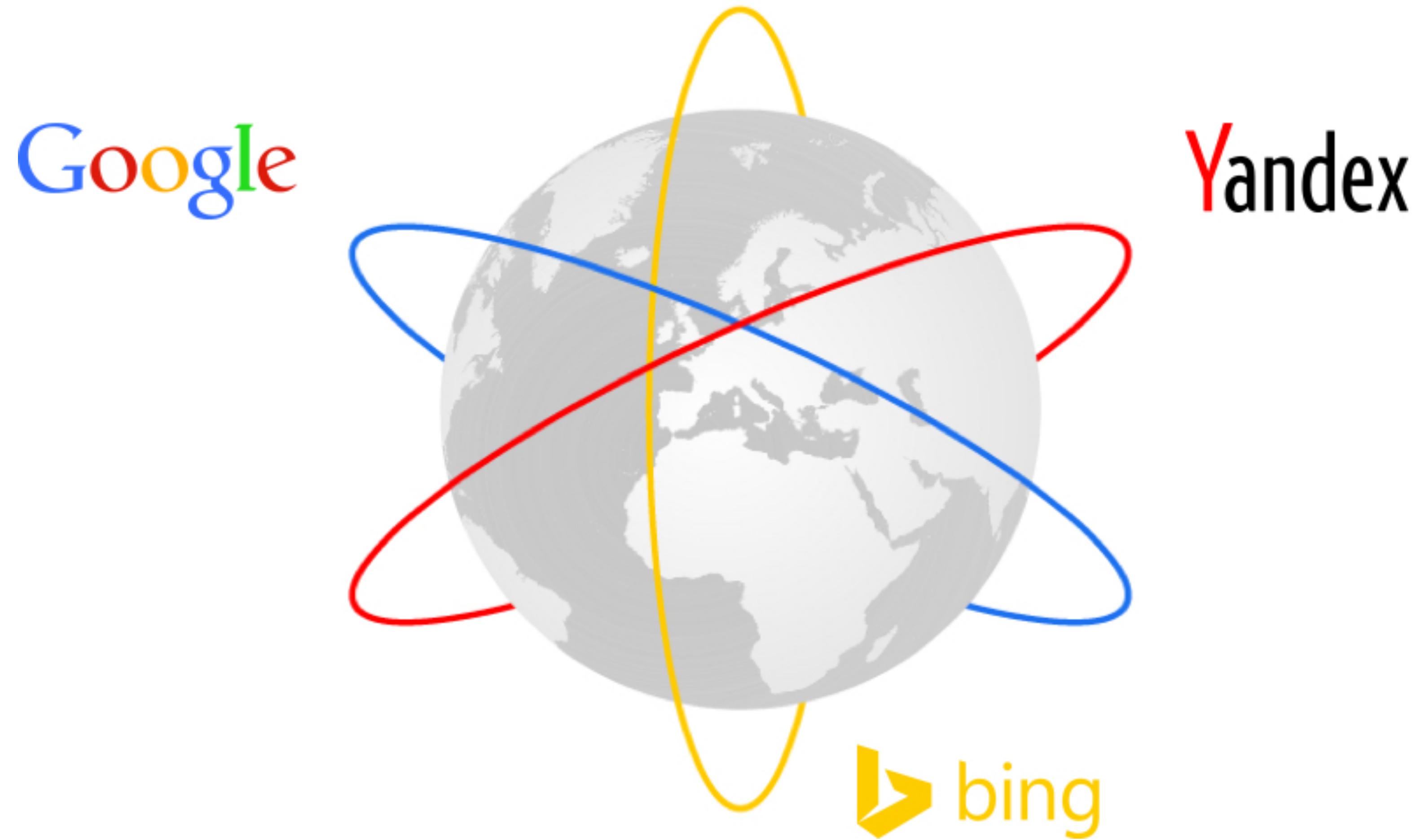
Andrey Ustyuzhanin

NRU HSE

YSDA

ICL

# Global Search Engines



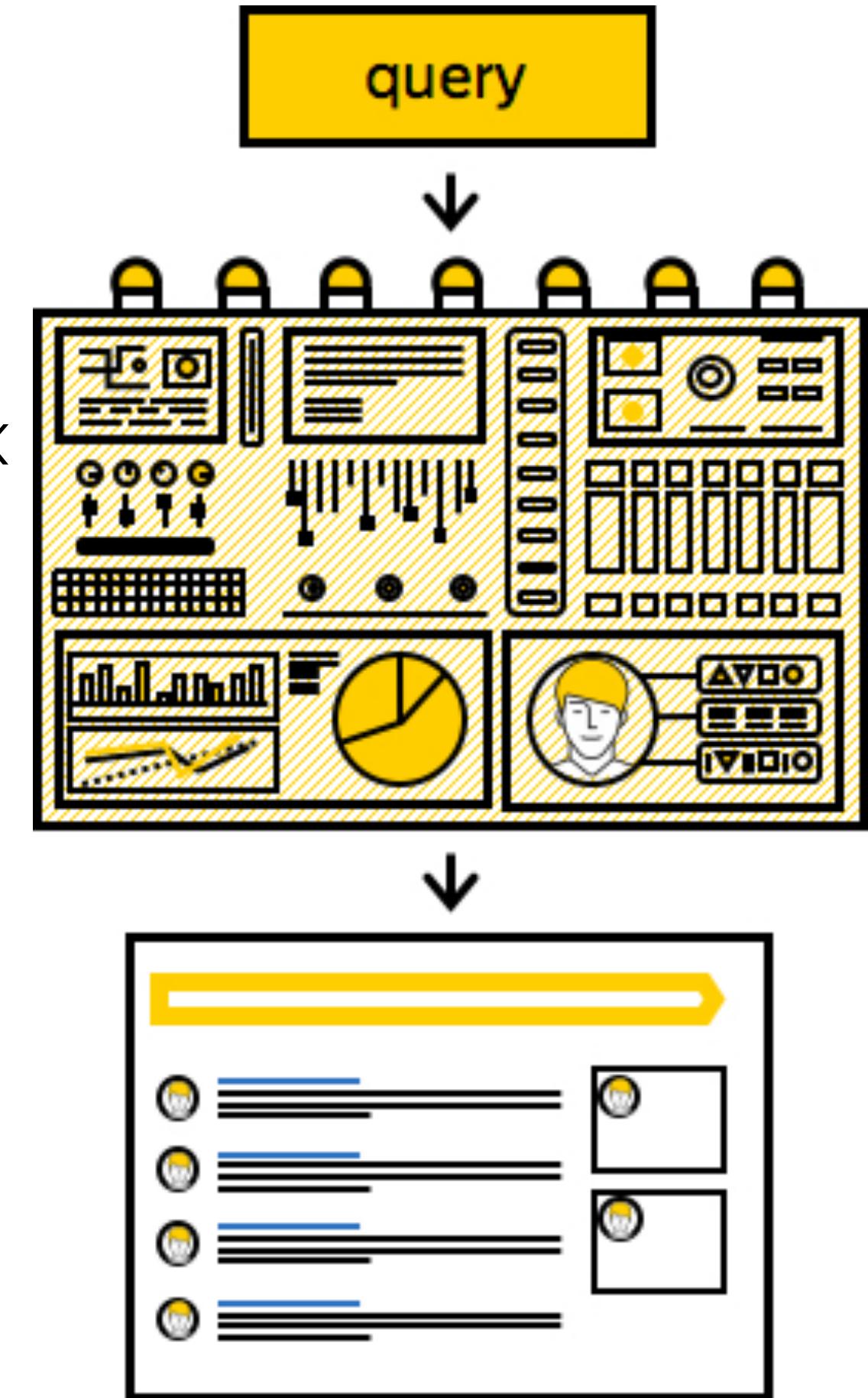
# Machine Learning at Yandex

## Search Engine tasks:

- › Processing of the entire web (~10<sup>10</sup> pages,  
<http://www.worldwidewebsize.com>)
- › Aggregation of users on behaviour analytics and  
micro-segmentation (~10<sup>8</sup>-10<sup>9</sup>)
- › Personalized delivery of relevant URLs/Images/Ads with the highest click  
probability

## Internal Machine learning application examples:

- › Navigation / maps
- › Natural Language Translation
- › Speech recognition/ synthesis
- › Ya.Market (aggregator of Internet Webstores)
- › Music streaming / recommendation
- › Weather prediction (“nowcasting”)
- › Ya.Taxi – demand prediction for specific space-time region, driving cars



# Yandex School of Data Analysis



SCHOOL OF DATA ANALYSIS

Established in 2007. Focuses the field of Statistics, Machine Intelligence and Deep Learning

Joint master's program with leading Russian universities

2 years, 12+ courses (<https://yandexdataschool.com/edu-process/program>)

Algorithms & Data Structures

Programming Languages (C++ and Python)

Machine Learning

Big Data Storage & Processing

Information Retrieval

Deep Learning

Reinforcement Learning

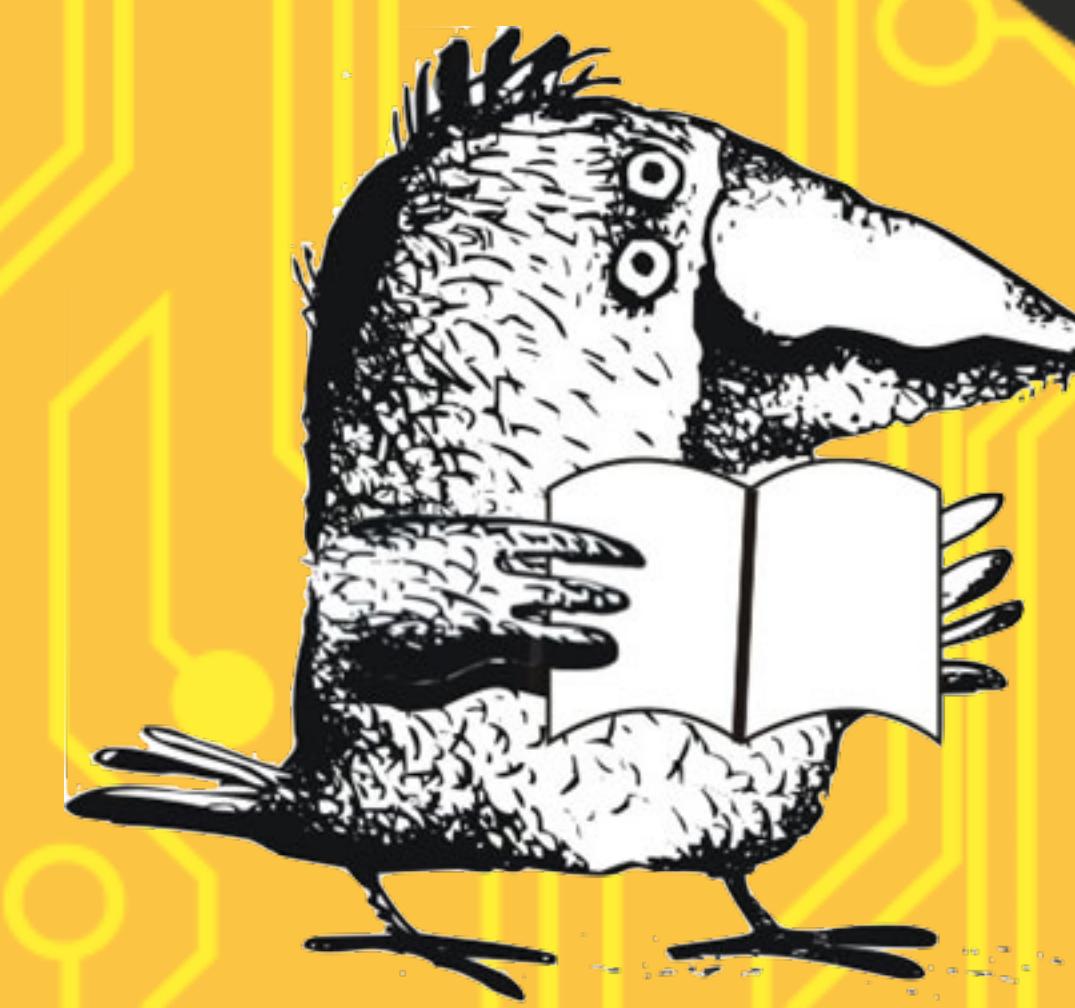
Admission:

4000 applications per year

250 are accepted per year

~600 graduated so far

Яндекс



# HSE Faculty of Computer Science

Established in March 2014,

Active support from Yandex (more than 50 lecturers/seminarists are Yandex employee)

- › Also cooperates with Kaspersky, WorldQuant, Huawei, ...

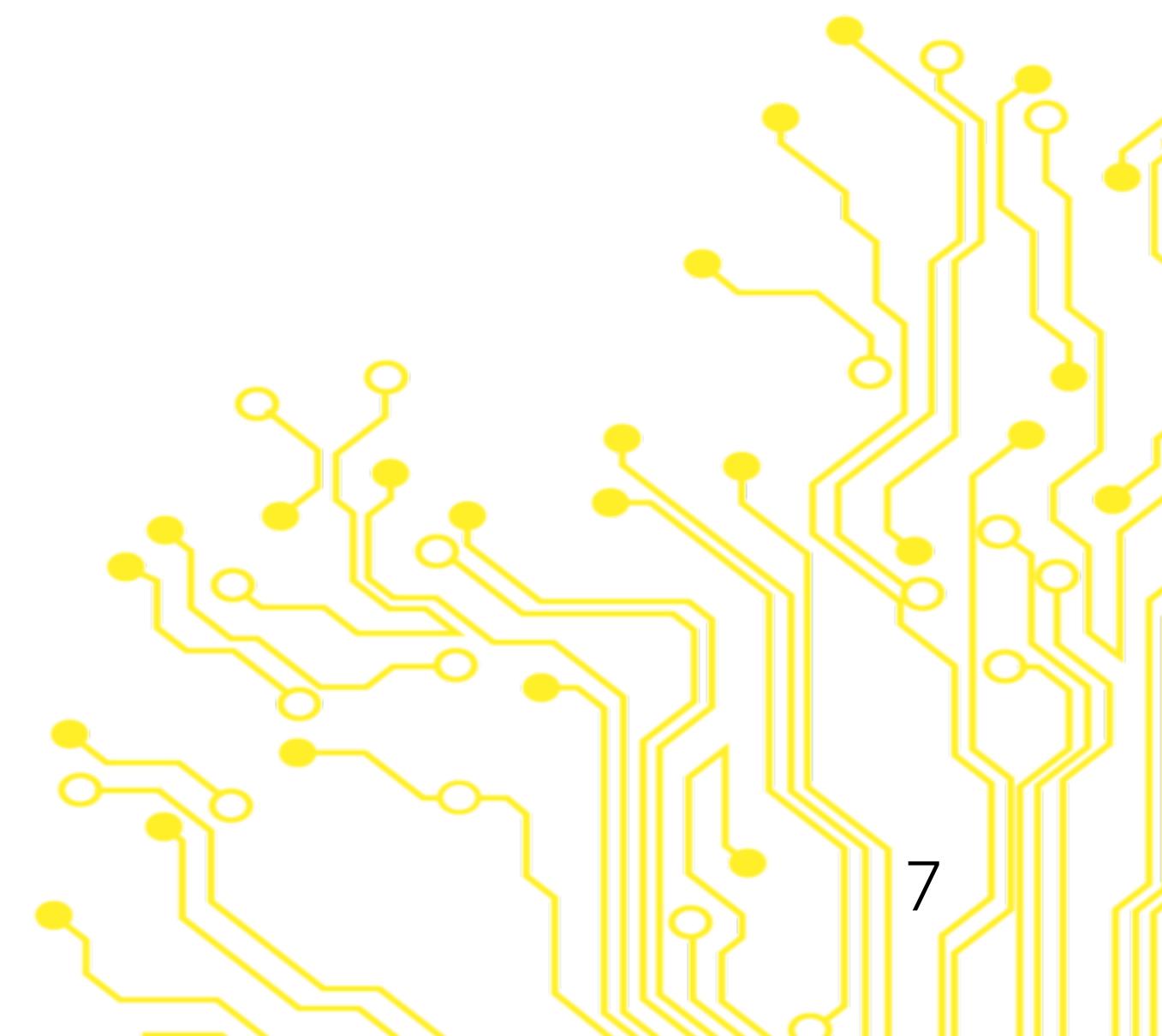
**Goal: enter the world's top 30 Computer Science faculties by 2020**

- › big data storing and processing,
- › software development and system programming,
- › machine learning

370 students enter bachelor program per year

~100 graduate master's program per year

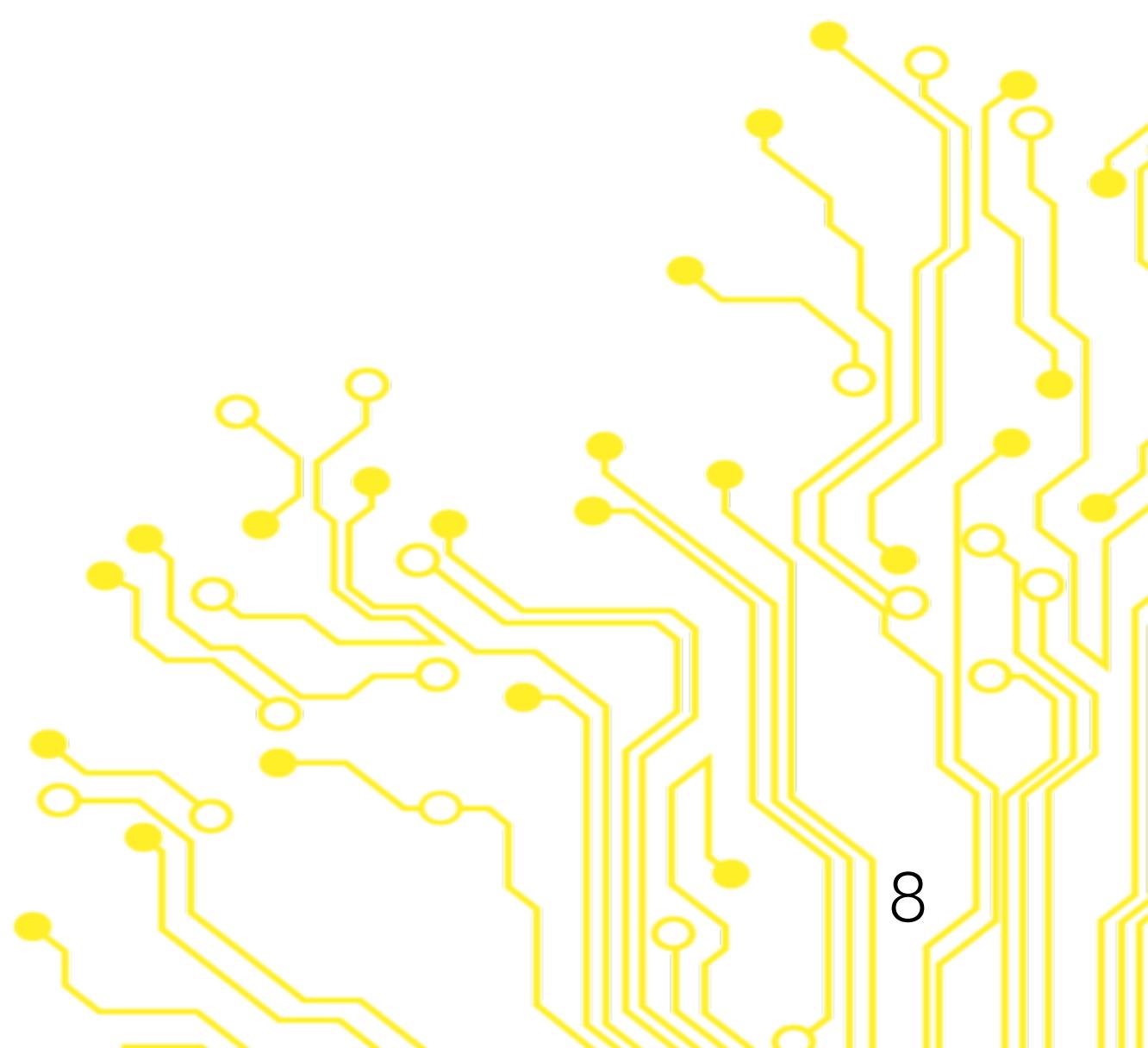
Member of LHCb collaboration since June 2018



# International Partner Universities

Humboldt-Universität zu Berlin  
Technische Universiteit Eindhoven  
Technische Universität Dresden  
Université Grenoble Alpes  
Université Blaise Pascal, Clermont Ferrand  
Radboud University, Nijmegen  
Aalto University, Helsinki  
Lappeenranta University of Technology

Andrey Ustyuzhanin



# Laboratory of Methods for Big Data Analysis

Group working on data analyses in Natural sciences

4 physicists and 15 computer scientists

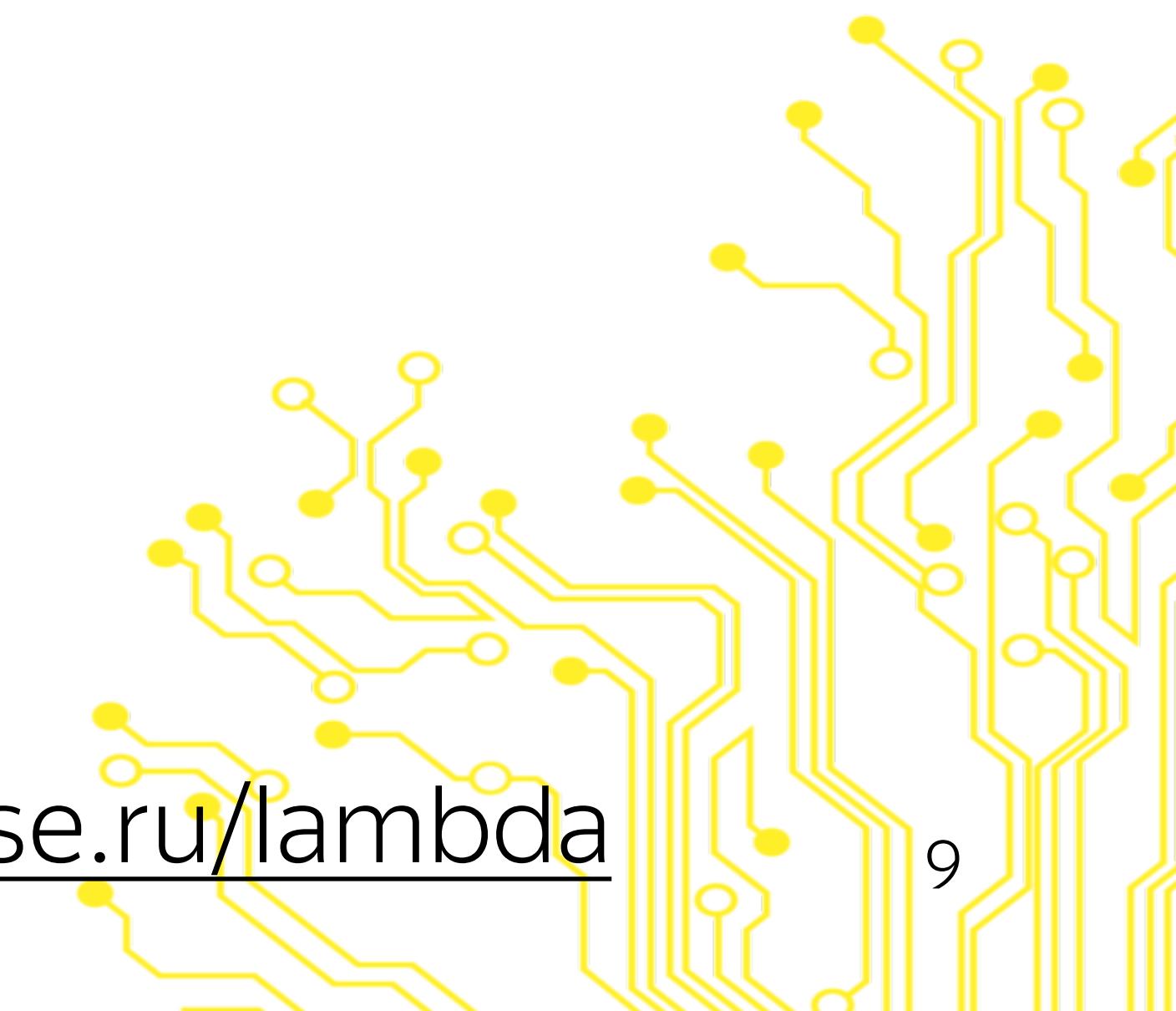
Close partnership with Yandex School of Data Analysis

Collaborates with LHCb, SHiP, OPERA, CRAYFIS experiments

Project examples:

- › Storage/Speed optimization for triggers
- › Particle Identification algorithms
- › Ultra-High Energy Cosmic Ray Detection
- › Fast MC Generation

Open for internships!



# MLHEP - iterative training experiment

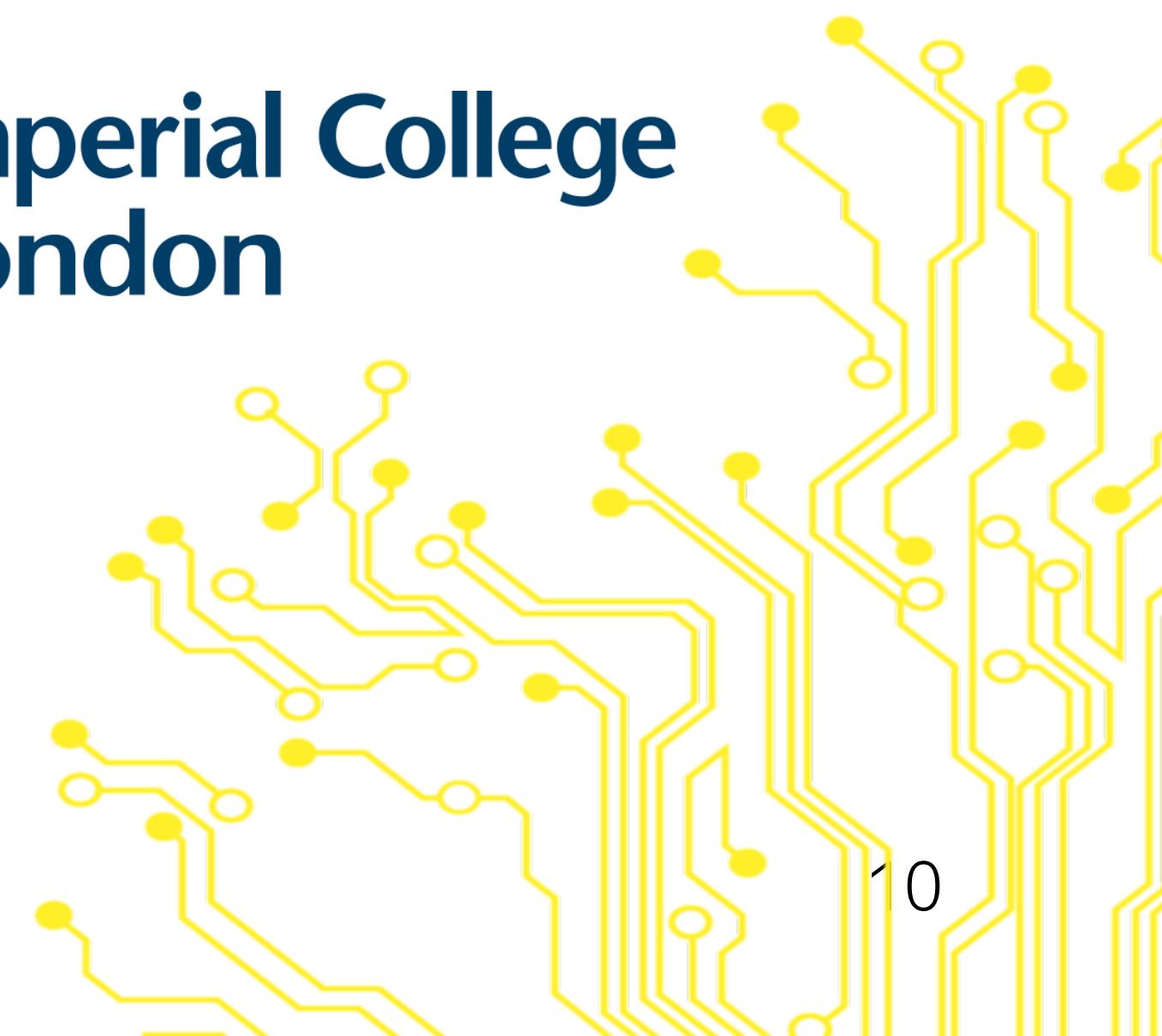
2015 – Academic University, Saint Petersburg, Russia



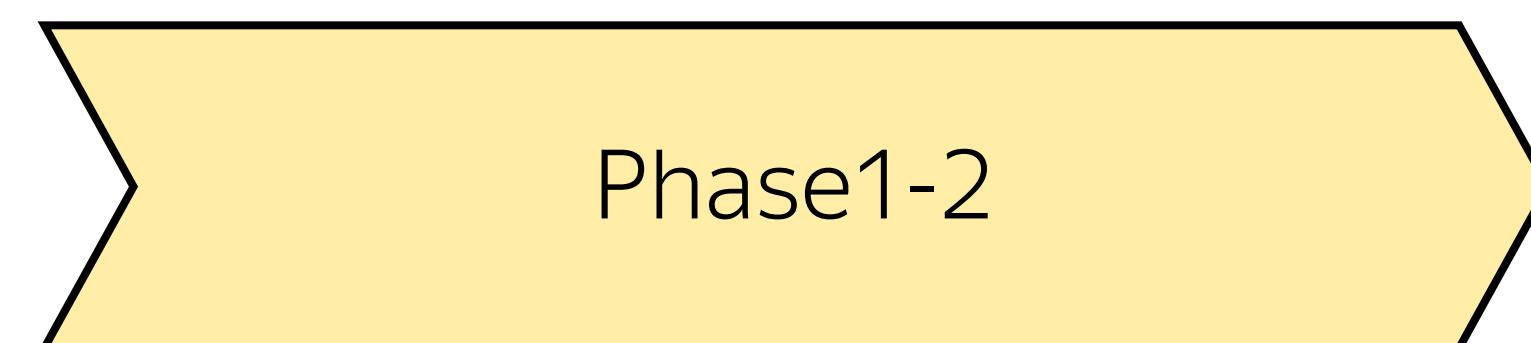
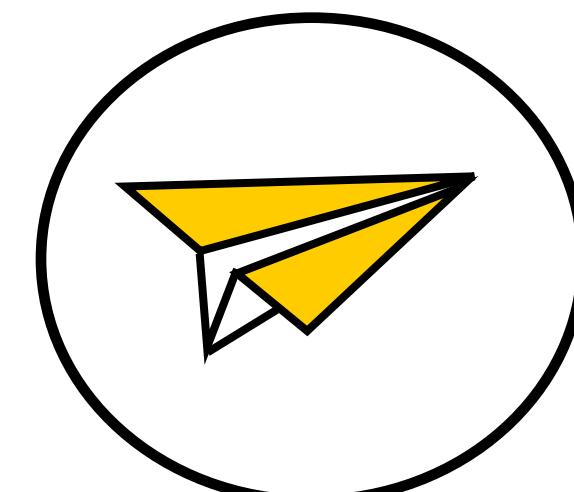
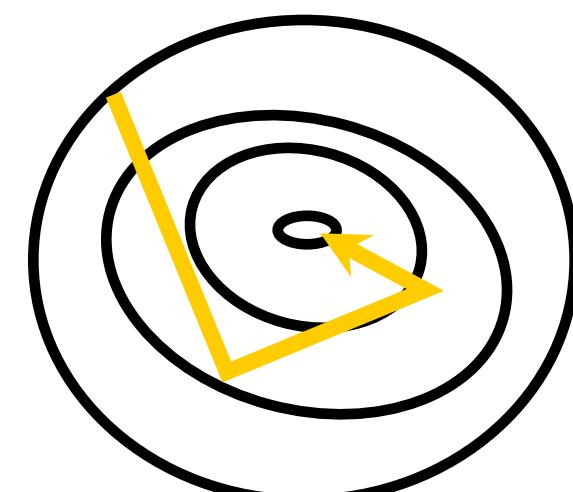
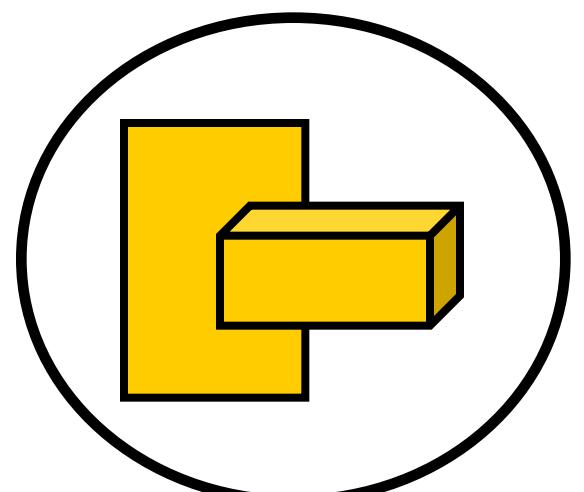
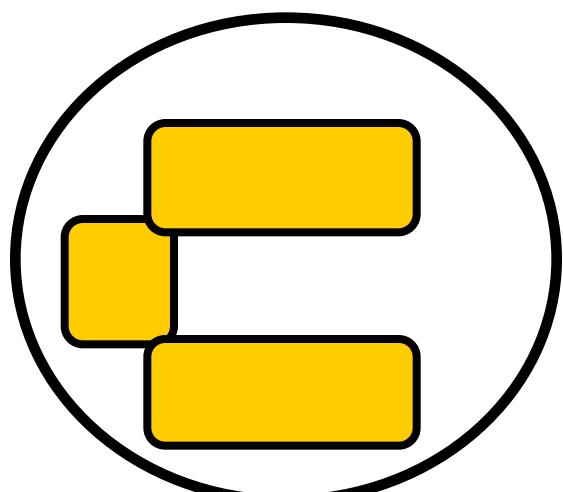
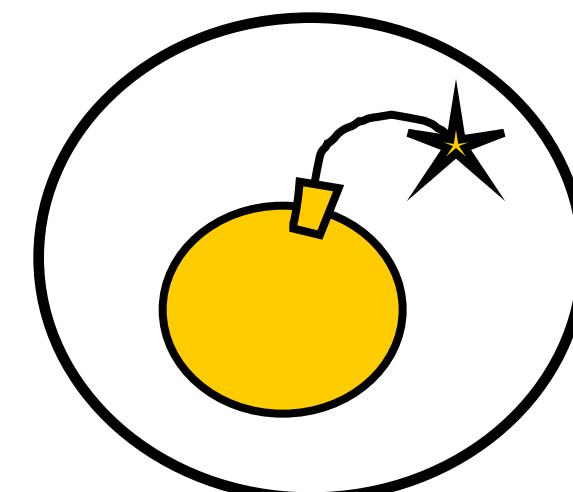
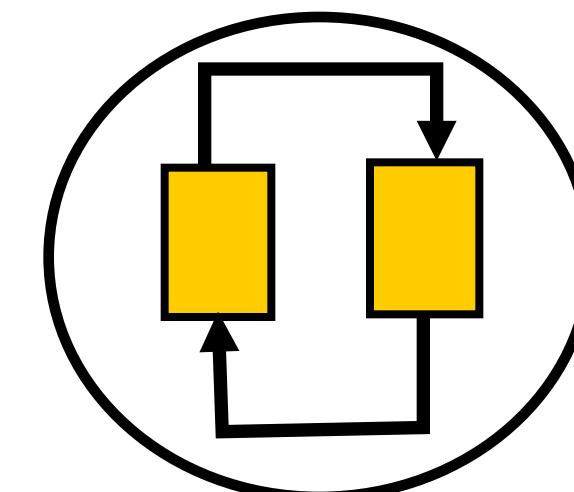
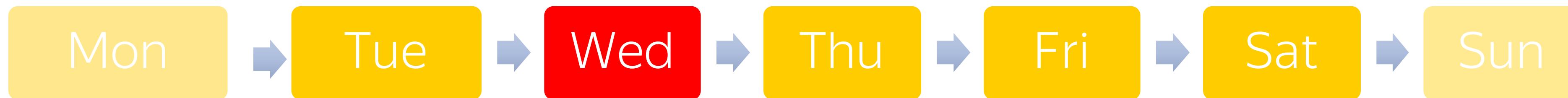
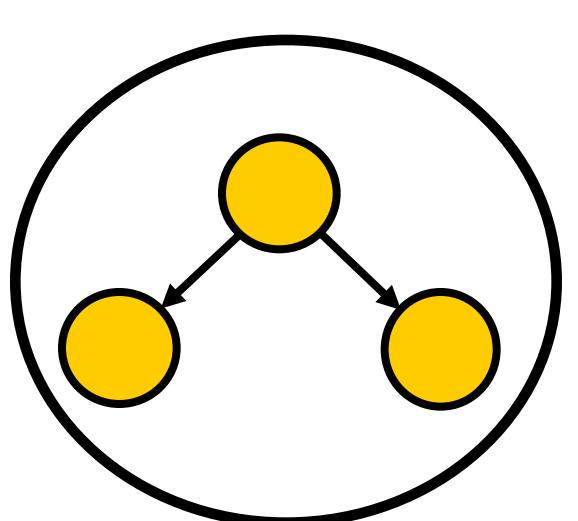
2016 – Lund University, Sweden



2017 – Imperial College London, Reading, UK



# MLHEP 2018 timeline



# Want more? Ask us how

Dr. Alexey Artemov, Skoltech, HSE

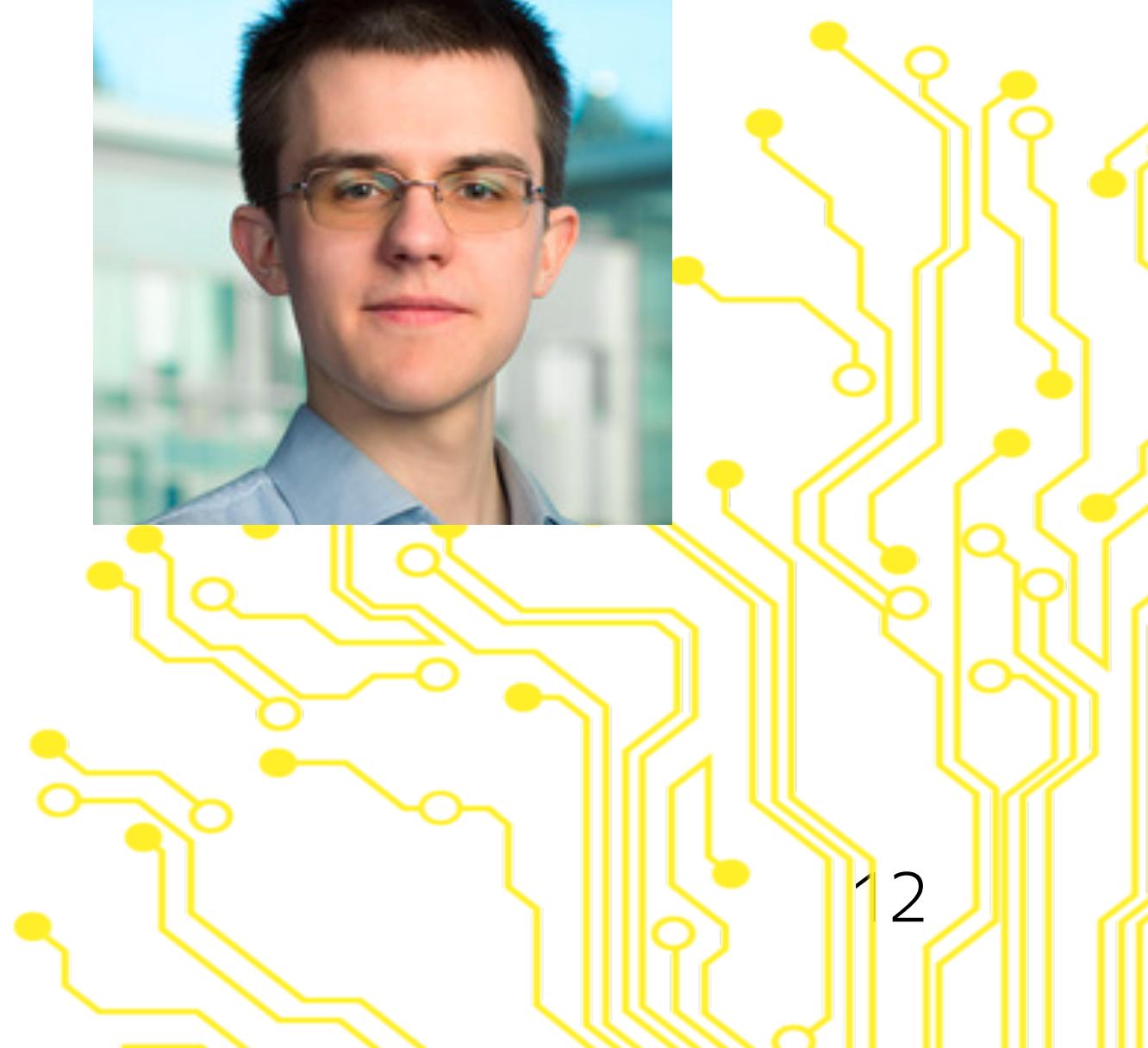
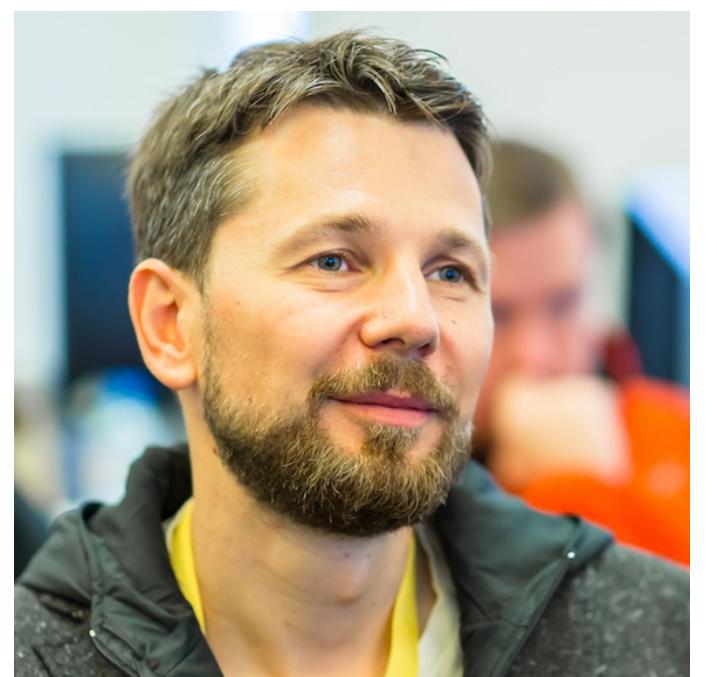
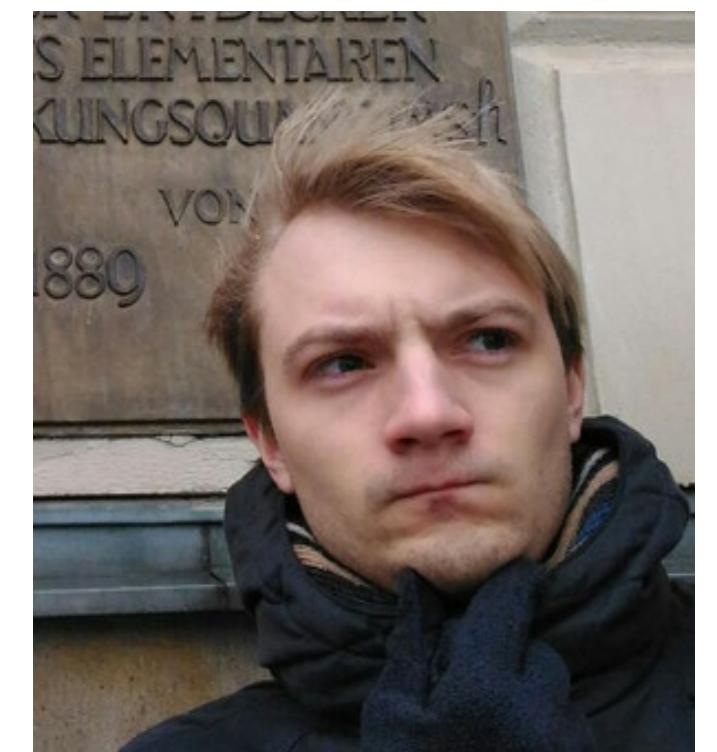
Dr. Ekaterina Chernyak, HSE

Maxim Borisyak, YSDA

Nikita Kazeev, YSDA, HSE

Dr. Andrey Ustyuzhanin, YSDA, HSE, ICL

Andrey Ustyuzhanin



# Oxford Team

Sue Geddes



Miha Zgubic



Daniela Bortoletta



Ian Shipsey



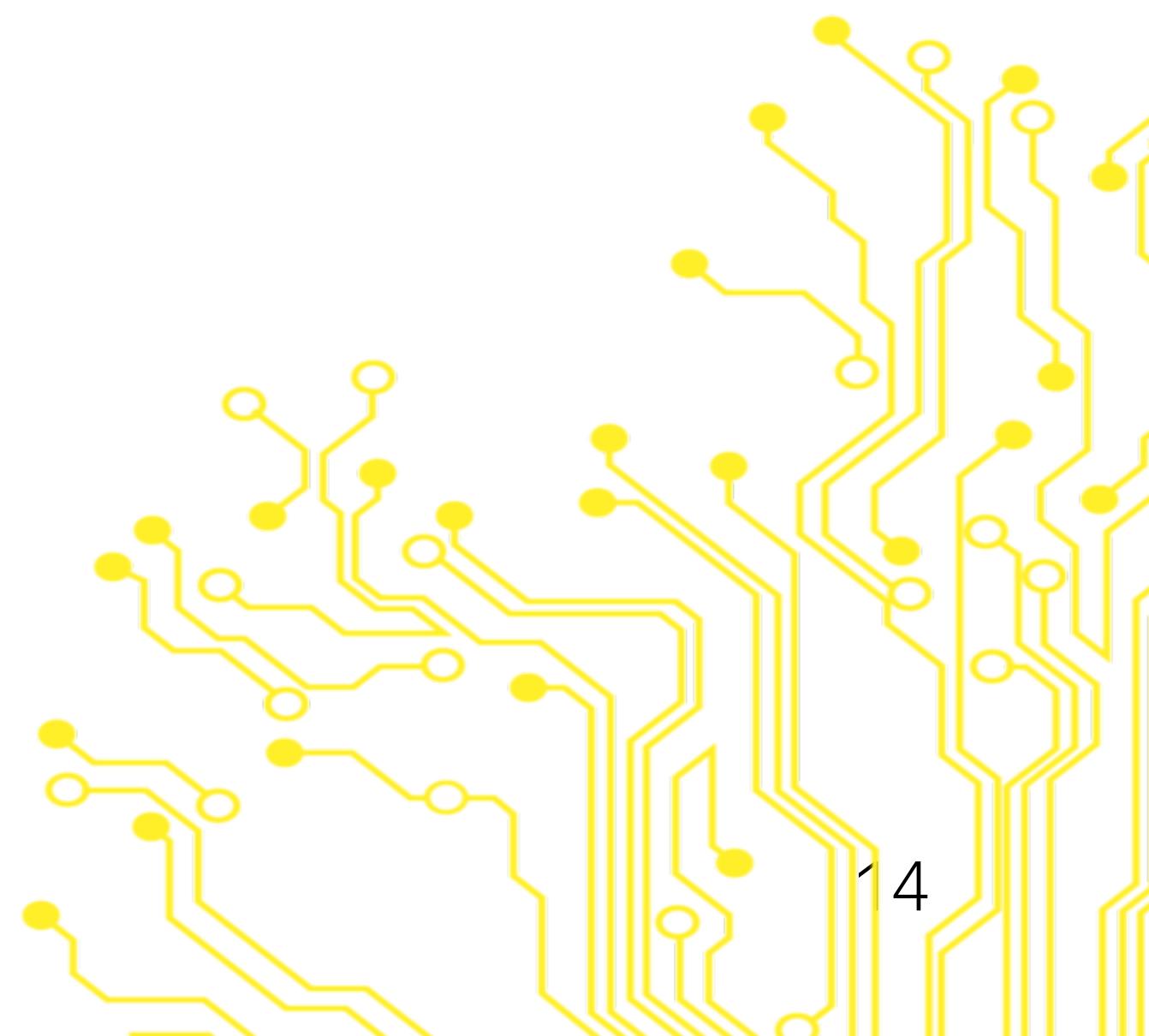
# Important Links

## Repository with slides and notebooks:

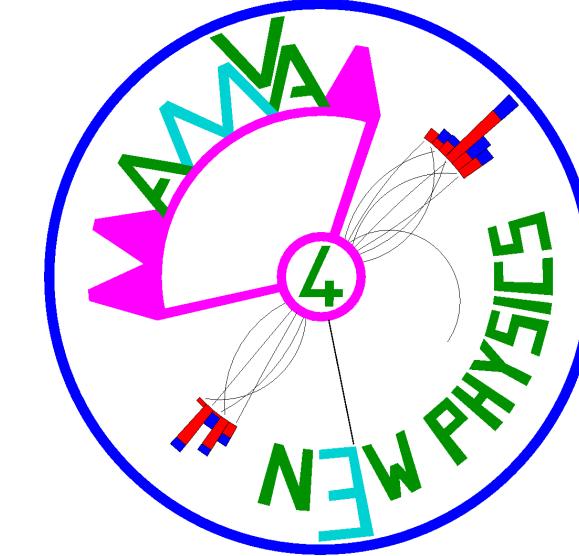
- › <https://github.com/yandexdataschool/mlhep2018>

## Distributed intelligence

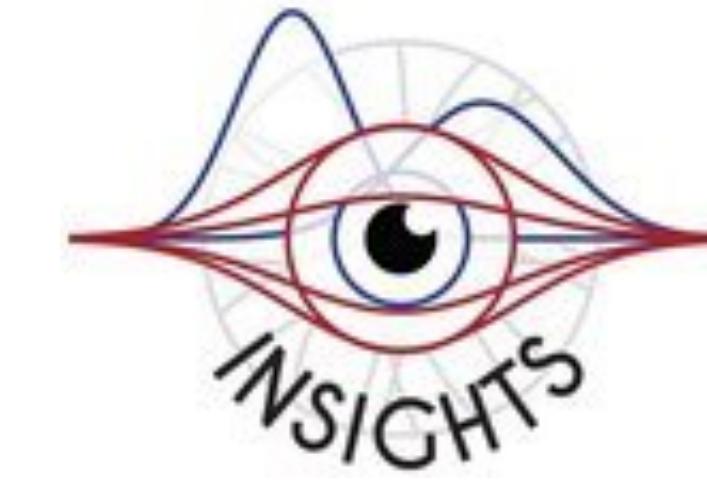
- › <https://t.me/joinchat/DMMgwguq9bJN58CVxDxX5Q>



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