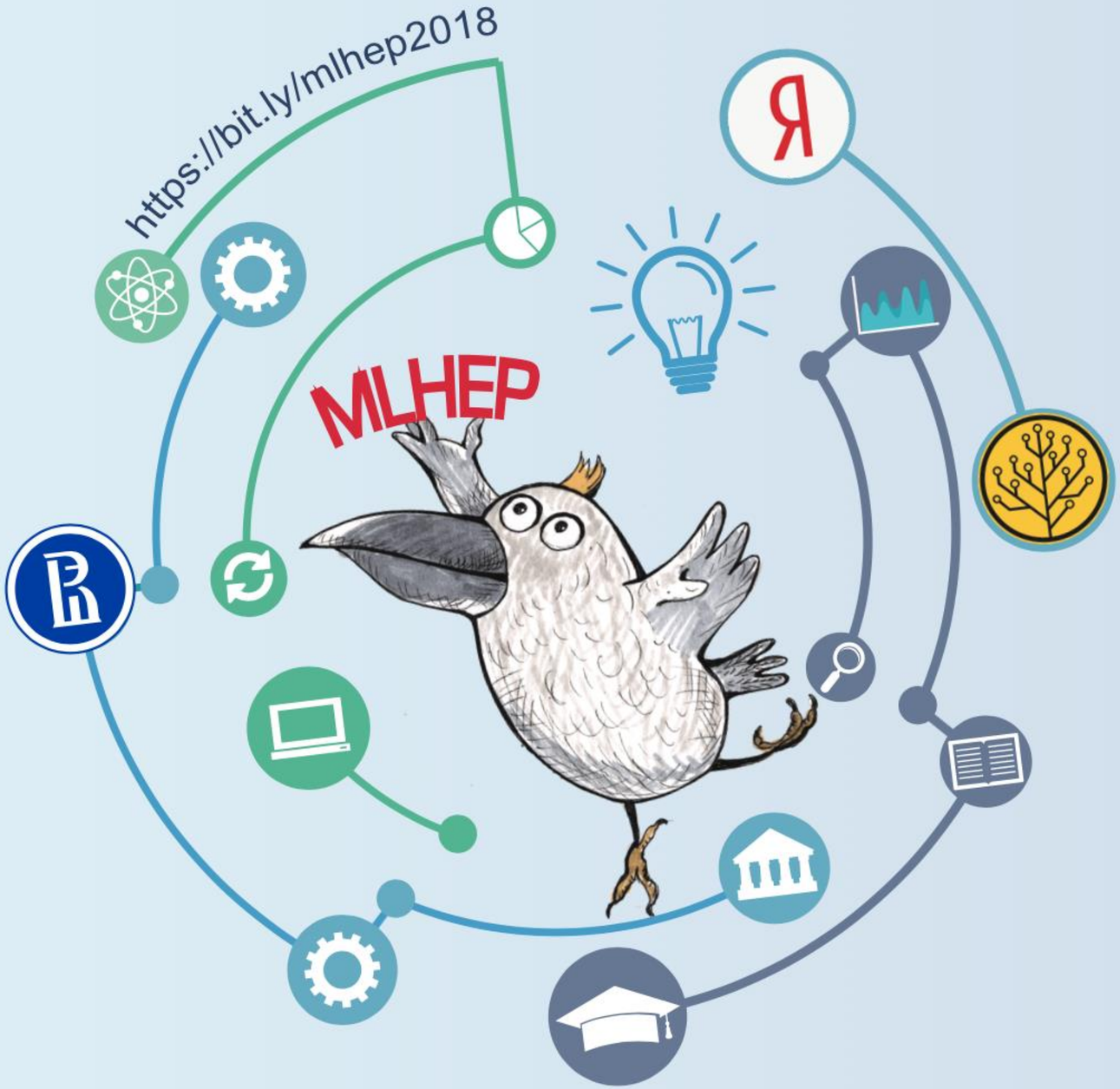


UNIVERSITY OF
OXFORD

Welcome to MLHEP!

2018-08-06, Oxford

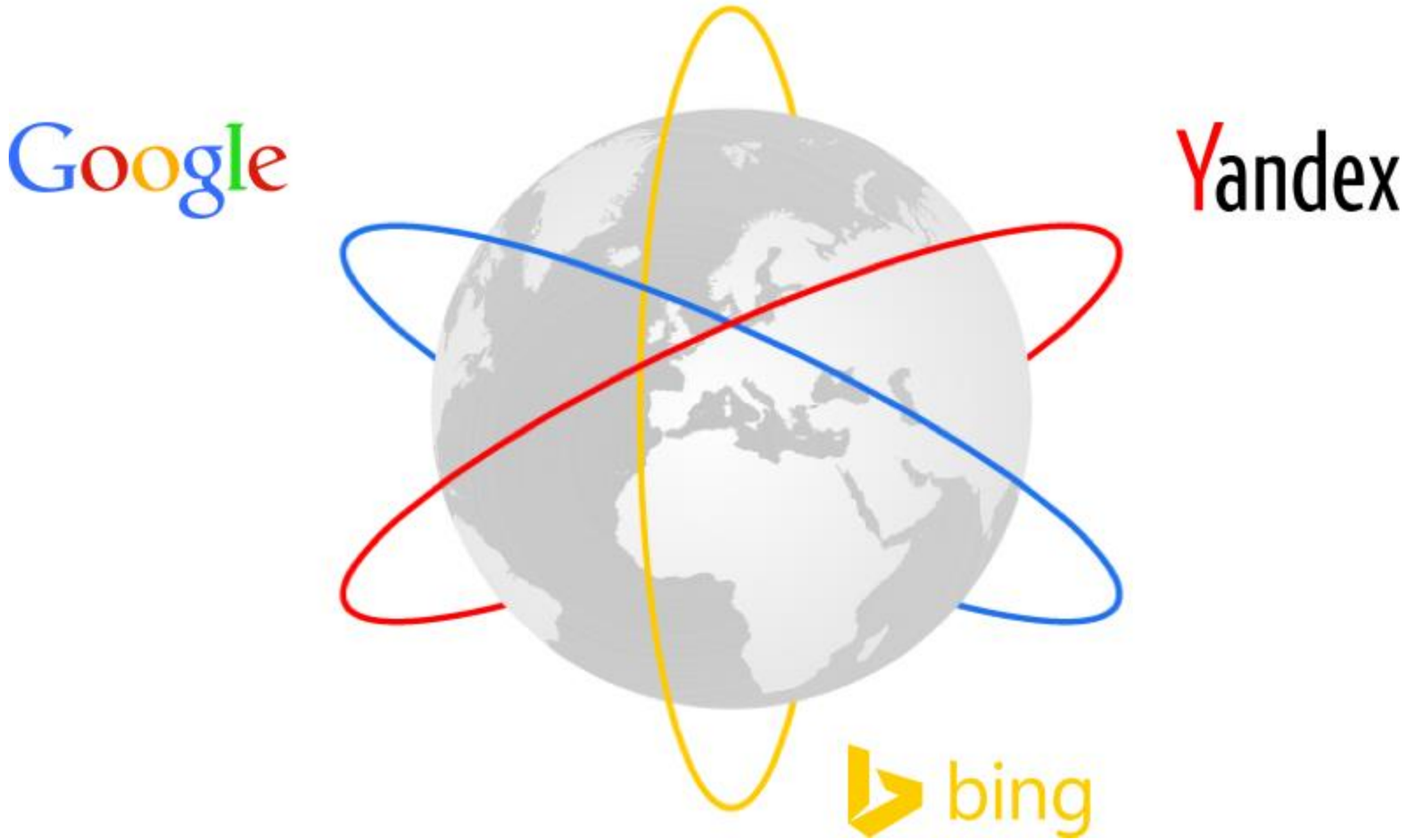
Andrey Ustyuzhanin

NRU HSE

YSDA

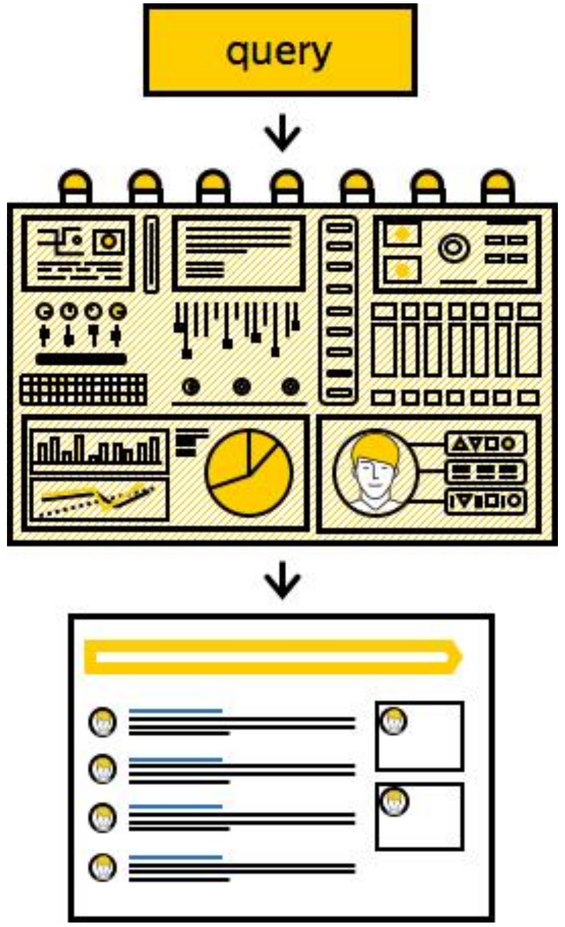
ICL

Global Search Engines



Machine Learning at Yandex

- Search Engine tasks:
  - Processing of the entire web (~1010 pages, http://www.worldwidewebsize.com)
  - Aggregation of users on behaviour analytics and micro-segmentation (~10^8-10^9)
  - 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

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

ВЫСШАЯ · ШКОЛА · ЭКОНОМИКИ ·

HSE Faculty of Computer Science

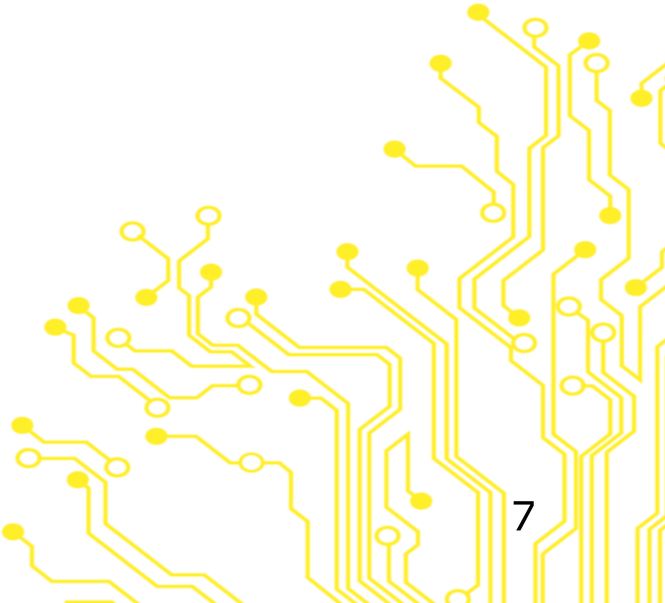
Established in March 2014,
Active support from Yandex (more than 50 lecturers/seminarists are Yandex employee)

- Also cooperates with Kaspersky, WorldQuant, Huawei, …

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

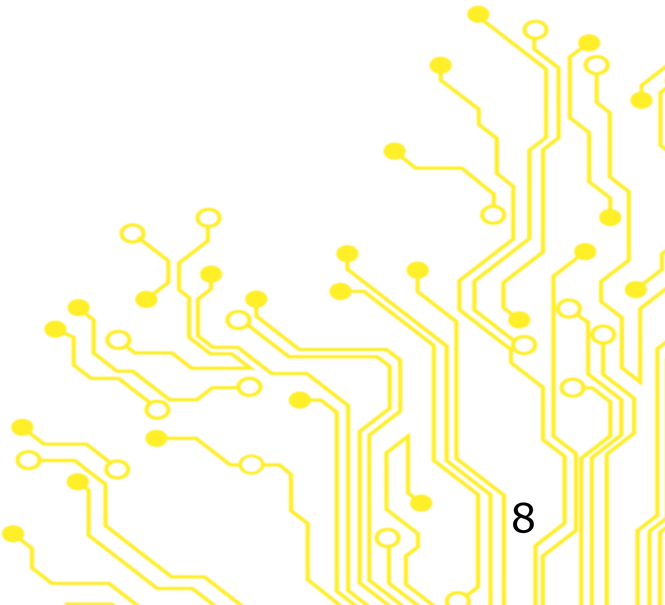
- big data storing and processing,
- software development and system programming,
- machine learning

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



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!

https://cs.hse.ru/lambda

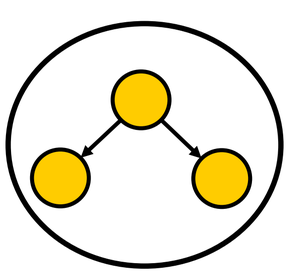
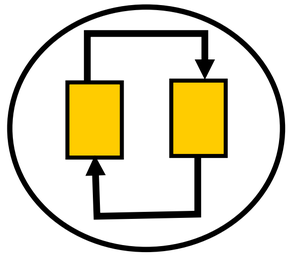
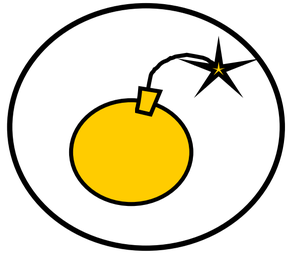
MLHEP - iterative training experiment

- 2015 – Academic University, Saint Petersburg, Russ
- 2016 – Lund University, Sweden
- 2017 – Imperial College London, Reading, UK

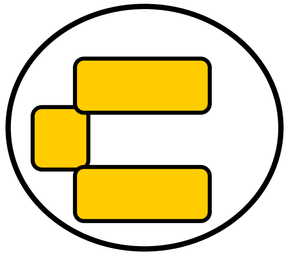
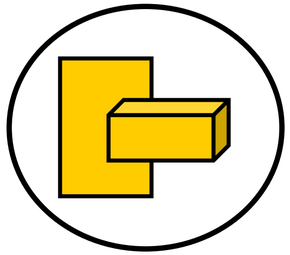
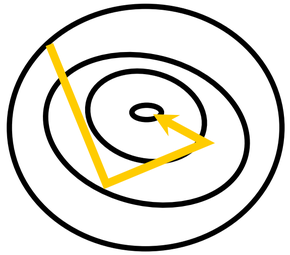
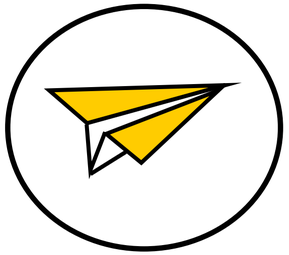
LUND UNIVERSITY

Imperial College London

MLHEP 2018 timeline

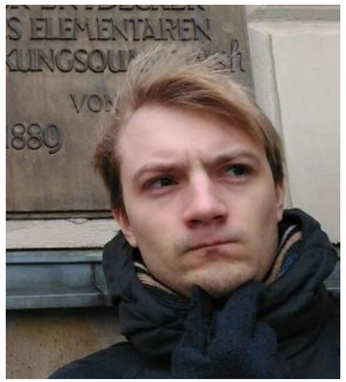
Mon → Tue → Wed → Thu → Fri → Sat → Sun

Phase1-2 | Phase3-4 | Phase5-6

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



Oxford Team

- Sue Geddes
- Miha Zgubic
- Daniela Bortoletta
- Ian Shipsey

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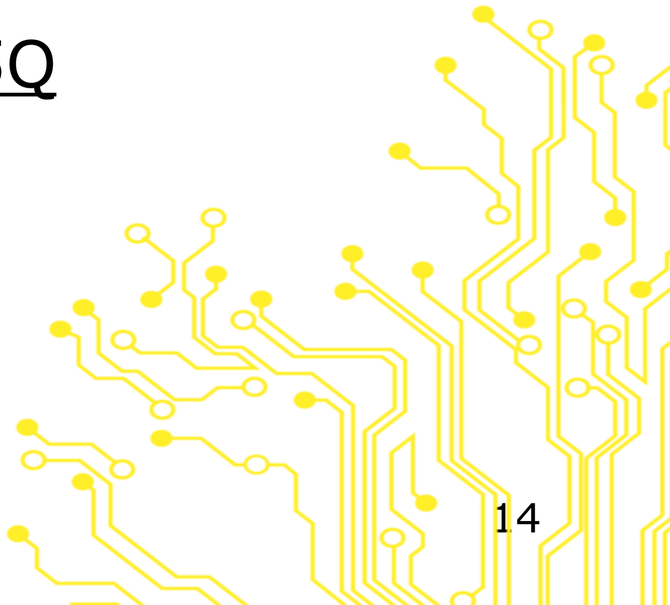
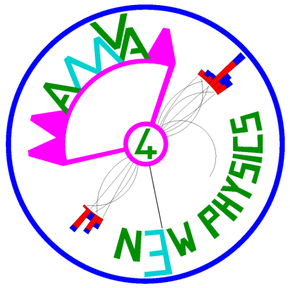
Important Links

- Repository with slides and notebooks:
  - https://github.com/yandexdataschool/mlhep2018
- Distributed intelligence
  - https://t.me/joinchat/DMMgwguq9bJN58CVxDxX5Q



Many thanks to our sponsors



https://amva4newphysics.wordpress.com

https://www.insights-itn.eu