

DISA @ LNU

Linnaeus University Center (conditionally approved) for
Data Intensive Sciences and Applications

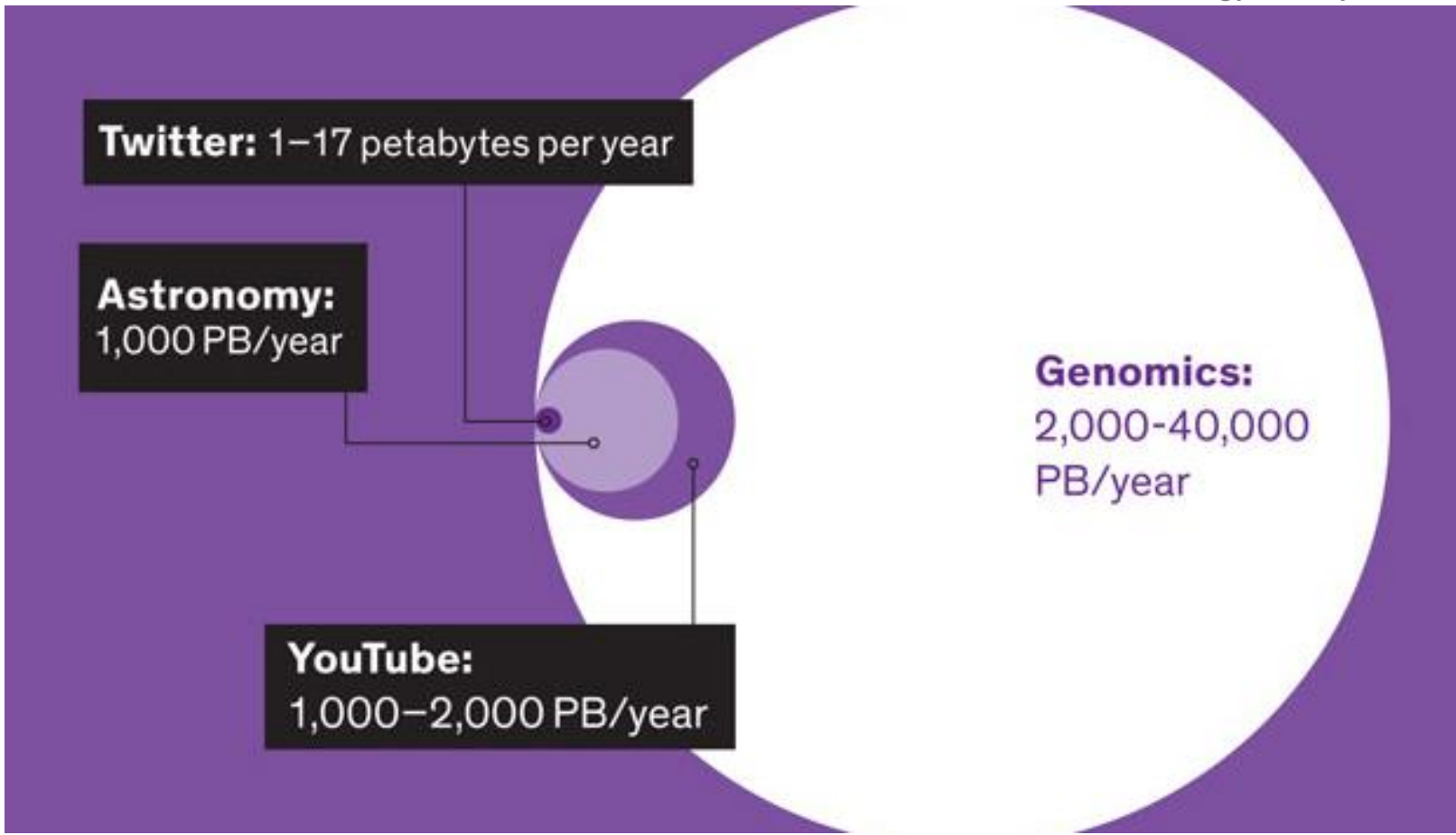
What is Big Data and what use can we
have of exploring it together?



Turn data into knowledge to *create value*

Projection for 2025, 1 petabyte = 1024 terabytes

Credit: PLOS Biology, 7 July 2015



Big Data – the profile of LNU

- DISA@LNU:
 - Multidisciplinary fundamental and applied Big Data research
 - Linnaeus University Center (conditionally approved)
 - Ca 72 MSEK from LNU alone until 2021
- IEC innovation institute: applied Big Data research and innovation projects
 - LNU thesis projects, IEC seed activities, externally funded research projects
 - Ca 5 MSEK from EU, LNU, Regions of Kalmar and Kronoberg until 2018
- ICT cluster: organizing collaborations of academia and industry
 - Big Data conferences, IEC digital week, IEC Big IT competence day
 - Ca 6 MSEK from EU, LNU, Regions of Kalmar and Kronoberg, Tunga fordon, TEC until 2018
- iSchools: effort in Big Data related courses and education programs



Big Data, Information, and Knowledge

Big Data: Analyzing data sets and streams to gain knowledge about technical, scientific, sociological or economical phenomena.

- **Data:** symbols, signals, bits & bytes, words, numbers, tokens, ...
- **Information:** data interpreted in a context, i.e. meaning
- **Knowledge:** actionable information, i.e. insights allow for controlling processes and giving predictions.



What is “Big” today and tomorrow?

- Challenging quantities that go beyond the capability of humans and commonly used software tools a constantly moving target, ranging from a few dozen terabytes (10^{12}) to many petabytes (10^{15}) today.
- Challenging qualities, as data comes in varying and complex formats, consisting of all types of structured and unstructured data.
- My computer has $\frac{1}{2}$ terabyte = 512 gigabytes of disk space
- 1 years of music, 20 days of video, 150'000 photos, 10 days of movies
- Projection for 2025:
1...40'000 petabytes/year = 1'000...40'000'000 terabytes/year.



Creating value from data is a *collaboration* effort

Credit: EU CROS portal



Ongoing Big Data collaborations

Collaboration with industry

- Common research projects Atlas Copco, Ericsson, IBM, IKEA, Intel, Meltwater, NVIDIA, Sigma Technology, Telia, Vattenfall, Yaskawa, ...
- Interests across industries

Collaboration with branch organization

- IT industry: IEC, SwedSoft
- Building construction: Smart Housing Småland, GodaHus
- Heavy vehicle industry: Tunga fordon
- Manufacturing: LTC, TEC

Collaboration with public sector

- Active project involvement of and financial support from the regional municipalities
- *eHälsomyndigheten* established in Kalmar much due to the activities at the eHealth Institute
- Collaboration with *Strålsäkerhetsmyndigheten*

New Big Data collaborations

- Offer towards industry, the public sector, and interested LNU researches
- Various research competences that we can contribute with (talks today)
- Many ways of collaboration
 - Thesis projects
 - High-Performance Computing Center
 - Data and Text Streaming Platform (social media and web data)
 - Seed projects
 - Digitalization courses and seminars for industry
 - Development of and contribution to educational programs
 - Workshops for developing realistic research and innovation projects with external funding
 - Research and innovation projects together with LNU
 - ...



Thesis projects

- Bachelor and Master thesis projects jointly supervised by industry and LNU
- Now is the time to submit ideas for the spring semester
- Why
 - Idea testing and prototyping
 - Explorative study
 - Get in contact with students as (future) customers
 - Get in contact with teachers as part of the marketing strategy
 - Assessment of students for hiring
 - IT support for internal development and innovation
 - Pilot for a larger research and innovation project together with LNU
- Contact Diana.UnanderNordle@lnu.se
- Check <https://coursepress.lnu.se/subject/thesis-projects/proposals>



High-Performance Computing Center (HPCC)

- The HPCC will be a high- performance computing platform providing advanced computing and storage infrastructure and knowledgeable scientific and technical staff.
- It will provide services to scientists and to the regional industry.
- The platform complements the large-scale computing and storage infrastructures that are available at the national level: SICS ICE and the Swedish National Infrastructure for Computing (SNIC).
- Core exists: two accelerated single-node systems; suitable for experimentation with limited-size problems.
- DISA invests ca. 2 MSEK, but more funding will be needed
- Contact Sabri.Pllana@lnu.se



Seed projects

- Collaborative innovation and research in Big Data with PhD students and senior researchers involved
- Based on a similar idea of seed activities of IEC to explore ideas and to jump start collaboration projects
- Requires multidisciplinary team or/and collaboration between industry, the public sector and LNU
- Fast decision (< 1 month), 3-6 month time for the activities, budget of max 200 KSEK from work time and resources from the IEC-project
- Why
 - Idea testing
 - Prototype development
 - Pilot for a larger research project
- Contact Diana.UnanderNordle@lnu.se



Digitalization courses and seminars for industry

- Content requested by industry spanning from testing to agile for business
- Organization of courses adapts to industry needs, e.g., with flexible runtime and admission
- Why
 - Lifelong learning for employees
 - LNU as a competence development hub for your business
 - No other costs than the work hours for your employees
- Contact Ola.Petersson@lnu.se



Research and innovation projects together with LNU

- Requirements as for seed projects (multidisciplinary or/and industry-academia)
- Longer planning and decision time (ca. 1 year)
- Longer project time (3-5 years),
- Higher funding (3-30 MSEK) but usually in-kind contributions required
- Why
 - LNU: keep or get back control over your research subject when there is a paradigm shift towards data-driven scientific approaches
 - Industry: don't miss benefitting from the of the data you have access to and get necessary R&D resources for free
- Contact Welf.Lowe@lnu.se



How to size the day?

- Listen to example collaborations
- Think about how you could benefit from/contribute to the presented projects and competences
- Discuss ideas and team up with people from research, industry, and the public sector
- Use our offers tick-off collaborations
- In any case of doubt contact Diana.UnanderNordle@lnu.se

