

# EDISON Data Science Framework (EDSF): Facilitating Data Science Curricula Development and organisational capacity building

## Introduction and Agenda

Yuri Demchenko, EDISON Project

University of Amsterdam

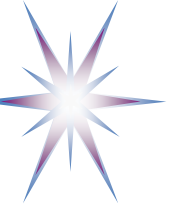
HPCS2019

15 July 2019, Dublin



**mates**





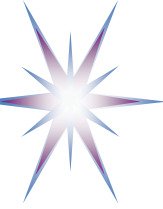
# Workshop Agenda

## **Part 1 13:30 – 15:00**

1. Introduction and bootstrapping (10 min)
  - EDISON Data Science Framework and EDISON Community Initiative
  - Workshop goals and attendees interests
2. Background information and how the EDSF has been done (20 min)
  - EU and International studies on data related competences and skills
  - EU standards, projects, initiatives, associations
3. EDISON Data Science Framework (EDSF) in details and walk through customised curriculum design (60 min)
  - EDSF components: Competence Framework (CF-DS), Body of Knowledge (DS-BoK), Model Curriculum (MC-DS), Data Science Professional Profiles (DSPP)
  - Walk through customised curriculum design: from target professional groups or competences to curriculum suggestions

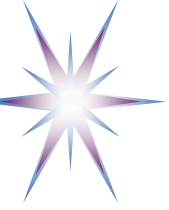
## **Part 2 15:00-15:30**

1. Data Scientist and Data Steward vacancy and CV analysis and matching from indeed.com – Interactive session and practice (in groups)
  - Analysis of Data Science and Data Steward CVs and Job vacancies
  - Matching exercise
2. Assessment and discussion on Data Science soft skills: workplace and 21st Century
3. Closing: comments, questions



# Yuri Demchenko, Senior Researcher, Assistant Professor, UvA

- Graduated and PhD from National Technical University of Ukraine “Kiev Polytechnic Institute”
  - University of Amsterdam – since 2003
- Research areas
  - Big Data Infrastructure and Data Science platforms
  - Intercloud Architecture Framework and cloud powered design, including DevOps and cloud automation platform
  - Cloud security and compliance
- Teaching courses (on campus and online)
  - Big Data Infrastructure and Technologies
  - Data Science Foundations, Professional Issues in Data Science
  - Cloud Computing Engineering, DevOps
  - Security Engineering
- Recent projects
  - EDISON: Building the Data Science Profession for Europe
  - MATES: Digitalisation of the European Blue Economy
  - CYCLONE: Multi-cloud automation platform for cloud based applications
  - GEANT4 Research: Cloud aware networking infrastructure provisioning on-demand



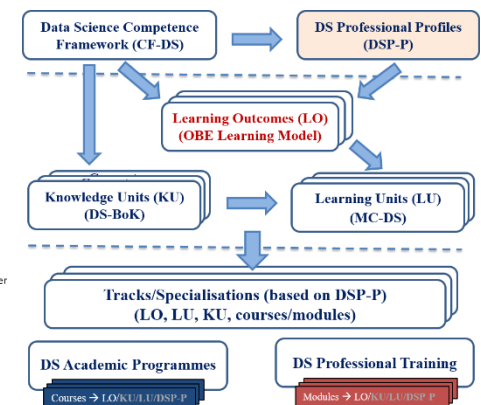
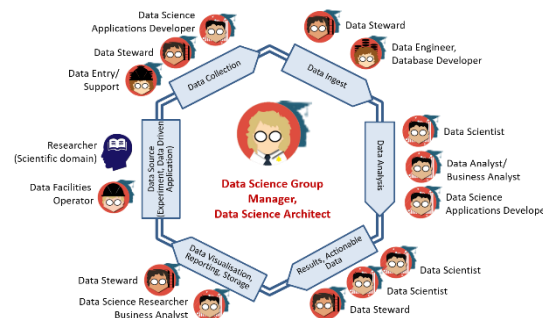
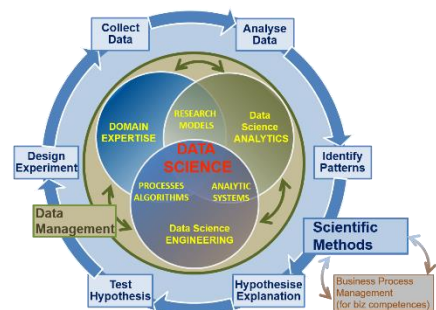
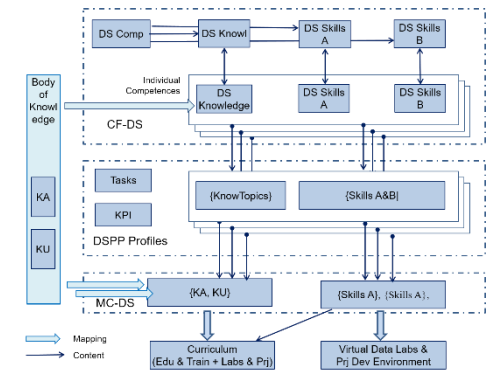
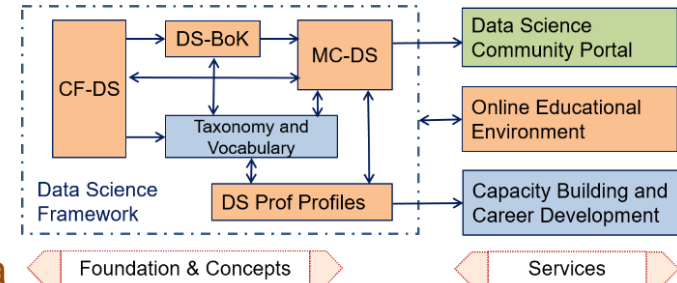
# INFRASUPP04 CSA Project EDISON

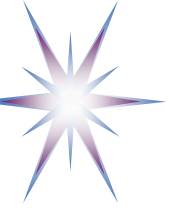
- University of Amsterdam (UvA) - NL
  - University of Stavanger (UiS) - NO
  - University of Southampton (Southampton) - UK
  - European Grid Initiative (EGI) - EU
  - Engineering (ENG) - IT
  - Forschungsinstitut für Telekommunikation und Kooperation (FTK) – DE
  - InMark - ES
- 
- September 2015 – August 2017



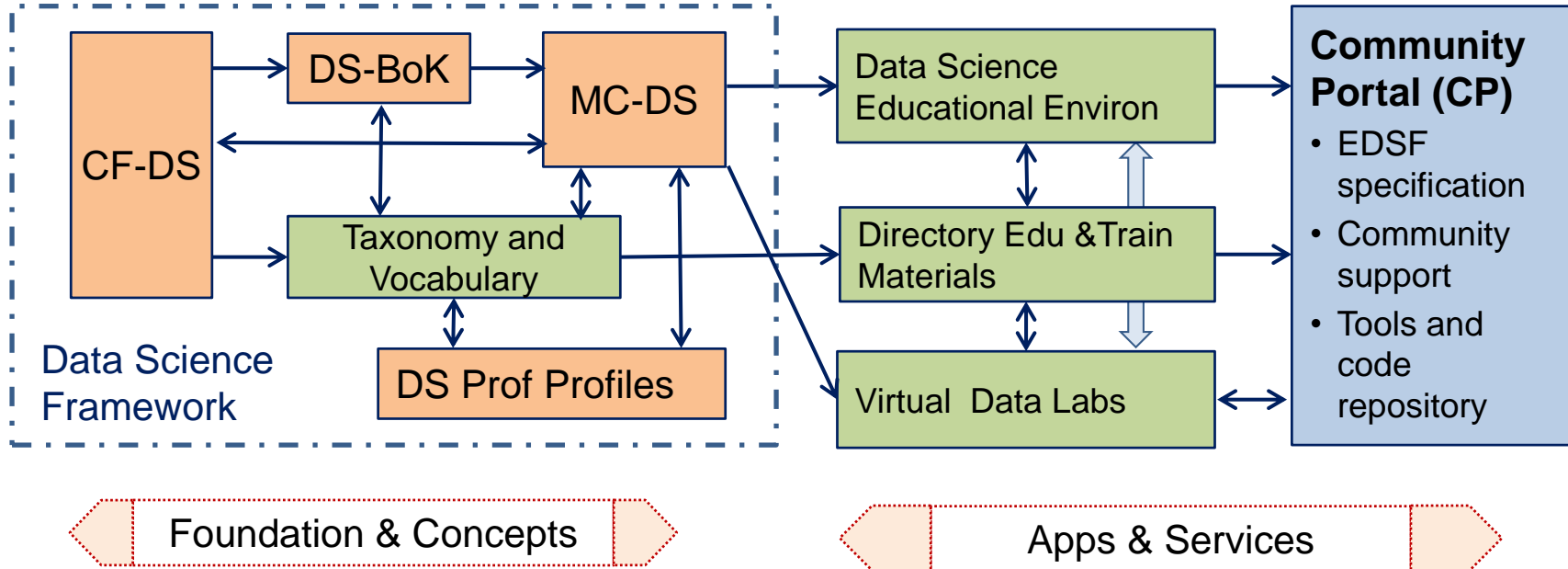
# EDISON Products for Data Science Skills Management and Curriculum Design

- EDISON Data Science Framework (EDSF)
  - Release 3 components CF-DS, DS-BoK, MC-DS, DSPP
  - Compliant with EU standards on competences and professional occupations e-CFv3.0, ESCO
- Skills development and career management for Core Data Experts and related data handling professions
- Academic programmes and professional training courses (self) assessment and design
- Individual competences benchmarking and Data Science team design
- Cooperation with International professional organisations IEEE, ACM, BHEF, APEC (AP Economic Cooperation)





# EDISON Data Science Framework (EDSF) – Core components and community maintained services

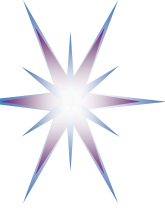


## EDISON Framework core components and documents

- CF-DS – Data Science Competence Framework (Part 1)
- DS-BoK – Data Science Body of Knowledge (Part 2)
- MC-DS – Data Science Model Curriculum (Part 3)
- DSPP – Data Science Professional profiles (Part 4)
- Data Science Taxonomies and Scientific Disciplines Classification

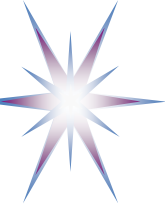
## Applications and Services

- Virtual Data Science Labs
- Data Science Educational Environment
- Directory of edu & train resources
- Community Portal – currently github



# EDSF Recognition, Endorsement and Implementation

- **DARE (Data Analytics Rising Employment)** project by APEC (Asia Pacific Economic Cooperation)
  - DARE project Advisory Council meeting 4-5 May 2017, Singapore
- **PcW and BHEF Report “Investing in America’s data science and analytics talent”** April 2017
  - Quotes EDSF and Amsterdam School of Data Science
- **Dutch Ministry of Education recommended EDSF** as a basis for university curricula on Data Science
  - Workshop “Be Prepared for Big Data in the Cloud: Dutch Initiatives for personalized medicine and health research & toward a national action programme for data science training”, Amsterdam 28 June 2016
  - Dutch Gov Program on re-skilling IT/data workers for DSA competences
- **European Champion Universities network**
  - 1st Conference (13-14 July, UK)
  - 2nd Conference (14-15 March, Madrid, Spain)
  - 3rd Conference 19-20 June 2017, Warsaw

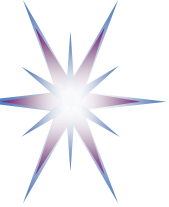


# Ongoing activities and developments

<https://github.com/EDISONcommunity/EDSF>

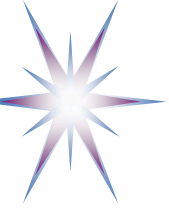
- **EDISON Community Initiative and Call for contribution EDSF Release 4**
  - Call for contribution Part 5 Use cases and Guidelines - Deadline 30 Sept 2019
  - EDSF Design Workshop – November 2019
  - Target publication EDSF Release 4 – December 2019
  - Call for sponsorship
- **Industry digitalisation projects and data literacy skills training**
  - **MATES project funded by EU ERASMUS Programme** - EU Maritime industry digital transformation, data skills development and Data + Ocean literacy
  - Skills for SME: Data Science, IoT, Cybersecurity: Prepare to Data Economy and Industry 4.0
- **DARE project by APEC** (Asia Pacific Economic Cooperation)
  - Continuing cooperation for Asia Pacific region
  - Recommended Data Science and Analytics Competences published August 2017 - [https://www.apec.org/Press/Features/2017/0620\\_DSA](https://www.apec.org/Press/Features/2017/0620_DSA)





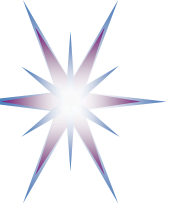
# Further development and exploitation

- Development of EDSF based tools
  - Competences benchmarking and Job market monitoring
- Inter-universities initiative “Data Science for UN’s Sustainable Development Goals” to focus in-curricula research (projects) on UN priority goals
- Toward EDSF and Data Science profession standardisation
  - ESCO (European Skills, Competences and Occupations) taxonomy
  - CEN TC428 (European std body) – Extending current eCFv3.0 and ICT profiles towards e-CF4 with Data Science related competences
  - Work with the IEEE and ACM curriculum workshop to define Data Science Curriculum and extend current CCS2012 (Classification Computer Science 2012)
- **Data Science Manifesto** – Primarily focused on professional and ethical issues in Data Science, new type of professional
  - Professional and ethical issues as a primary focus



# EDISON Initiative Online Presence

- EDSF github project - <https://github.com/EDISONcommunity/EDSF>
  - Component documents CF-DS, DS-BoK, MC-DS, DSPP
- EDISON Community work area and discussions - <https://github.com/EDISONcommunity/EDSF/wiki/EDSFhome>
- Mailing list - [edison-net@list.uva.nl](mailto:edison-net@list.uva.nl)
- EDISON project website - old domain *edison-project.eu* expired: Legacy information to be moved to <http://edison-project.net/>



# Links to EDISON Resources

- EDISON Data Science Framework Release 3 (EDSF)  
<https://github.com/EDISONcommunity/EDSF>

## Component EDSF documents

CF-DS – Data Science Competence Framework

[https://github.com/EDISONcommunity/EDSF/blob/master/EDISON\\_CF-DS-release3-v09.pdf](https://github.com/EDISONcommunity/EDSF/blob/master/EDISON_CF-DS-release3-v09.pdf)

DS-BoK – Data Science Body of Knowledge

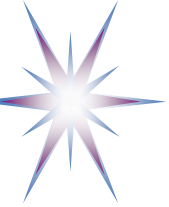
[https://github.com/EDISONcommunity/EDSF/blob/master/EDISON\\_DS-BoK-release3-v04.pdf](https://github.com/EDISONcommunity/EDSF/blob/master/EDISON_DS-BoK-release3-v04.pdf)

MC-DS – Data Science Model Curriculum

[https://github.com/EDISONcommunity/EDSF/blob/master/EDISON\\_MC-DS-release3-v04.pdf](https://github.com/EDISONcommunity/EDSF/blob/master/EDISON_MC-DS-release3-v04.pdf)

DSPP – Data Science Professional profiles

[https://github.com/EDISONcommunity/EDSF/blob/master/EDISON\\_DSPP-release3-v05.pdf](https://github.com/EDISONcommunity/EDSF/blob/master/EDISON_DSPP-release3-v05.pdf)



# Other related links

- Amsterdam School of Data Science
  - <https://www.schoolofdatascience.amsterdam/>
  - <https://www.schoolofdatascience.amsterdam/education/>
- Research Data Alliance interest Group on Education and Training on Handling of Research Data (IG-ETHRD)
  - <https://www.rd-alliance.org/groups/education-and-training-handling-research-data.html>



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