HITRI plus
Heavy Ion Therapy Research Integration

Federated Learning System Application in Heterogenous Healthcare Datasets

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STUDENT PRESENTATION

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101008548

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Short summary

- Bachelor’s degree at the Faculty for Information Technology at the Mediterranean University, Montenegro
- At the moment:
  - Specialist’s programme at the Mediterranean University
  - Master's programme in Software Engineering at the Mälardalen University in Västerås through an Erasmus scholarship – Research regarding safety-critical systems with Bombardie
  - Teaching assistant at the Mediterranean University
  - Back-end developer

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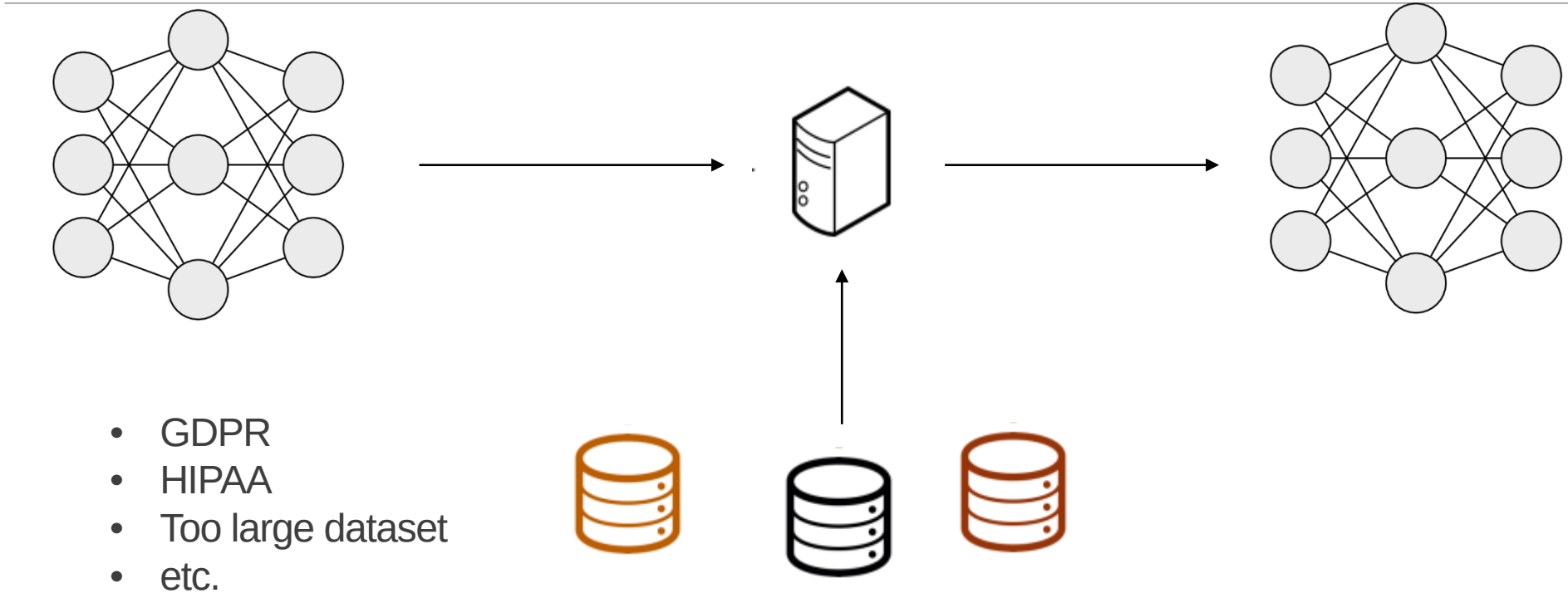
Machine/Deep Learning



- GDPR
- HIPAA
- Too large dataset
- etc.

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Methods used

- Differential privacy
- Secure multi-party computation
- …
- **Federated learning**

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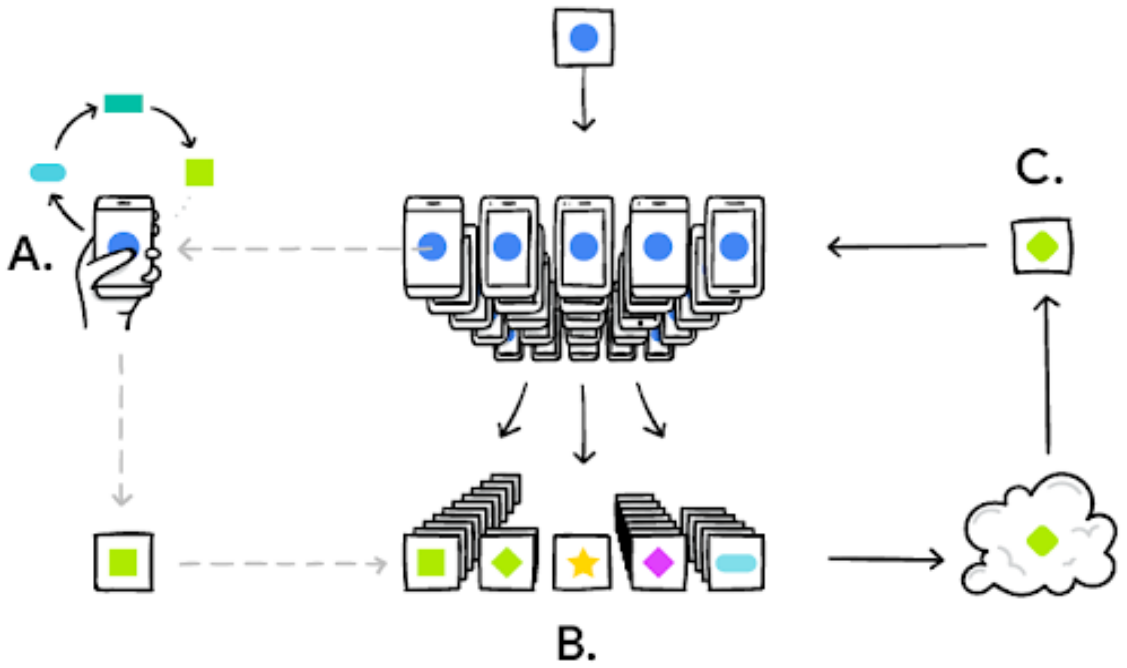
Federated learning



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Phases

1. Collect **some** patient information – complicated
2. Analyze the datasets to see which methods would be most applicable
3. Homogenisation – adjust/calibrate outputs of institutions so we can use them in the shared model
4. Continuously train the model

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Privacy

- Analyzing Federated Learning through an Adversarial Lens (2018)
- How To Backdoor Federated Learning (2019)
- How To Break Anonymity of the Netflix Prize Dataset (2006)

Movie	User	Rating	Date
1	823519	3	2004-05-03
2	2059652	4	2005-09-05
3	1025579	4	2003-03-29

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THANK YOU

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