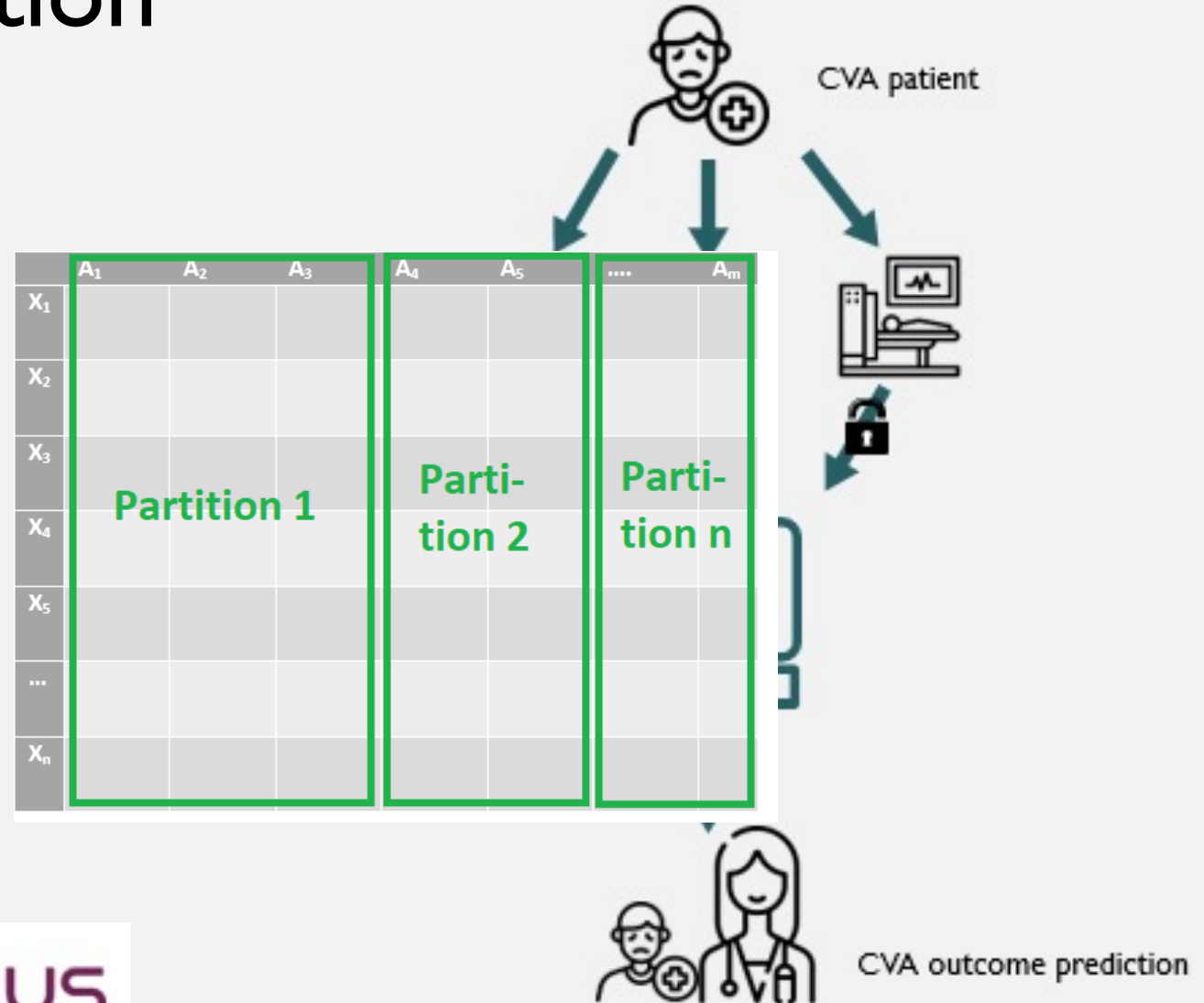


Vertical Federated Learning for CerebroVascular Accident Rehabilitation

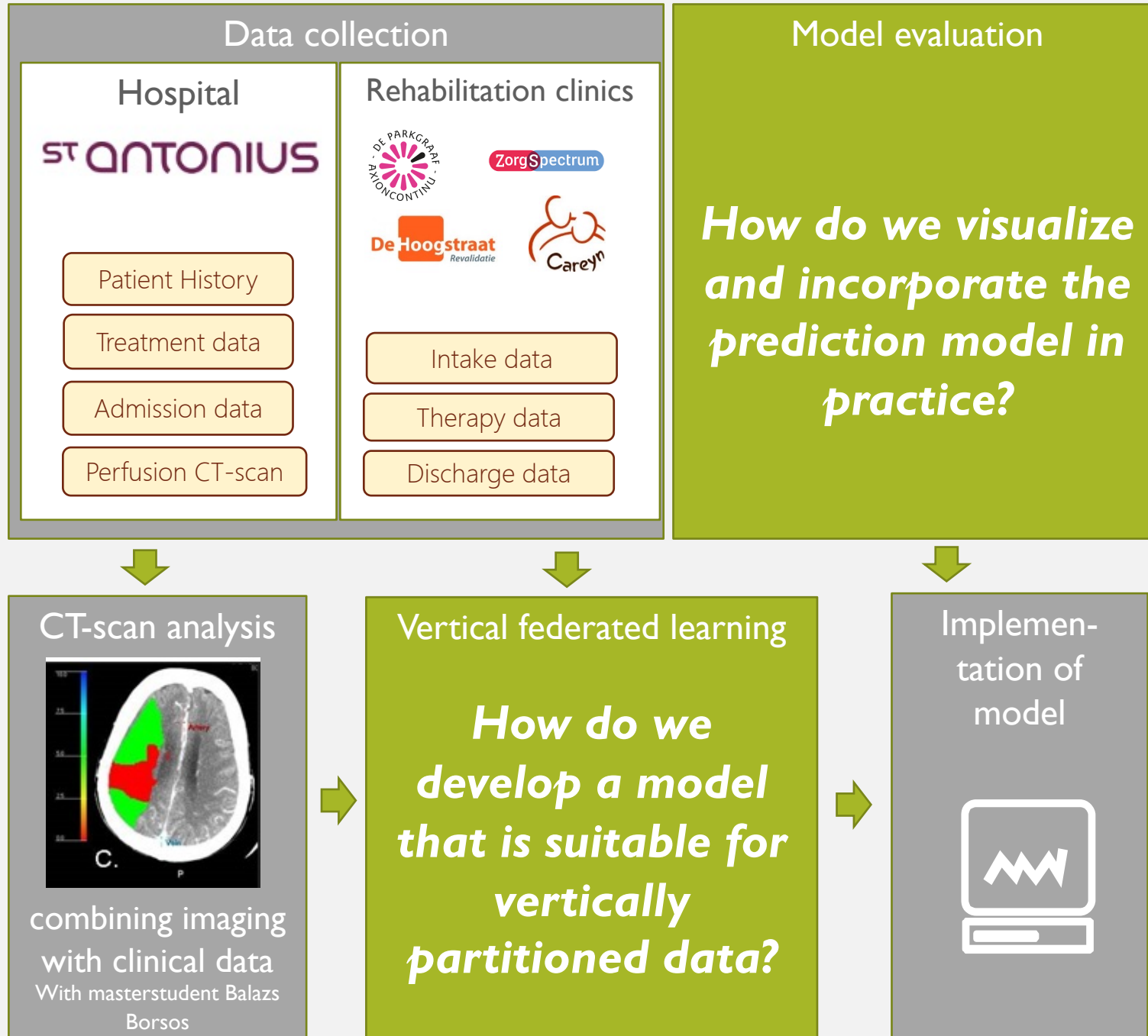


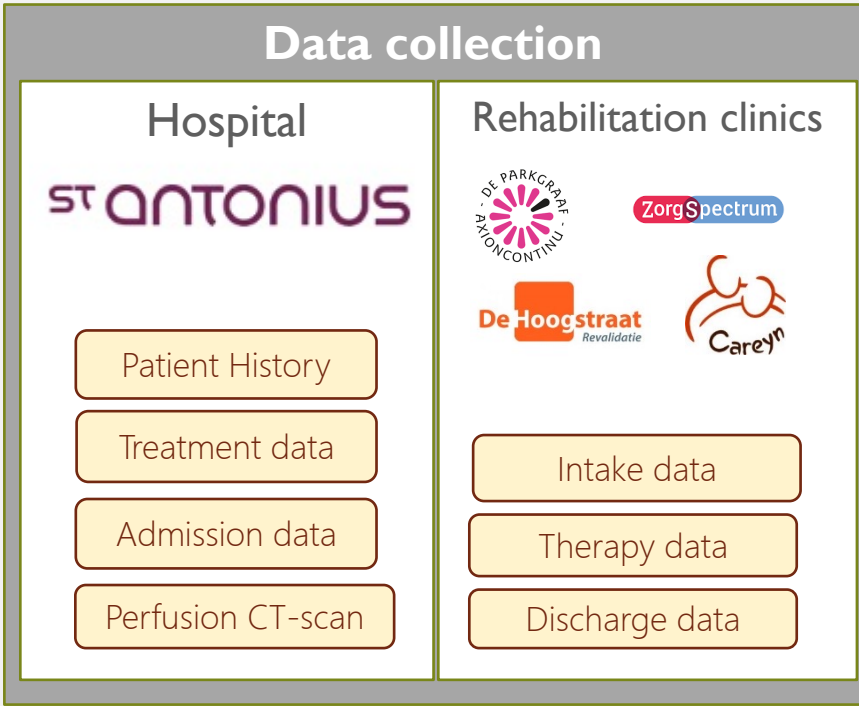
Corinne Allaart

Enabling Personalized Interventions @ ICTOpen2022

Supervisors: Aart van Halteren, Henri Bal, Paul van der Nat, Lea Dijkman, Douwe Biesma

Vertical Federated Learning for CVA Rehabilitation

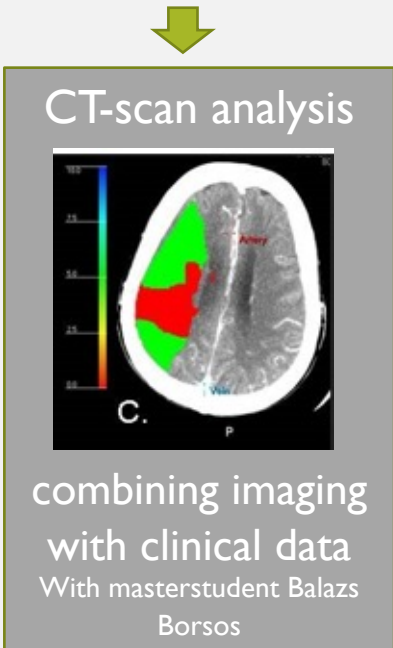
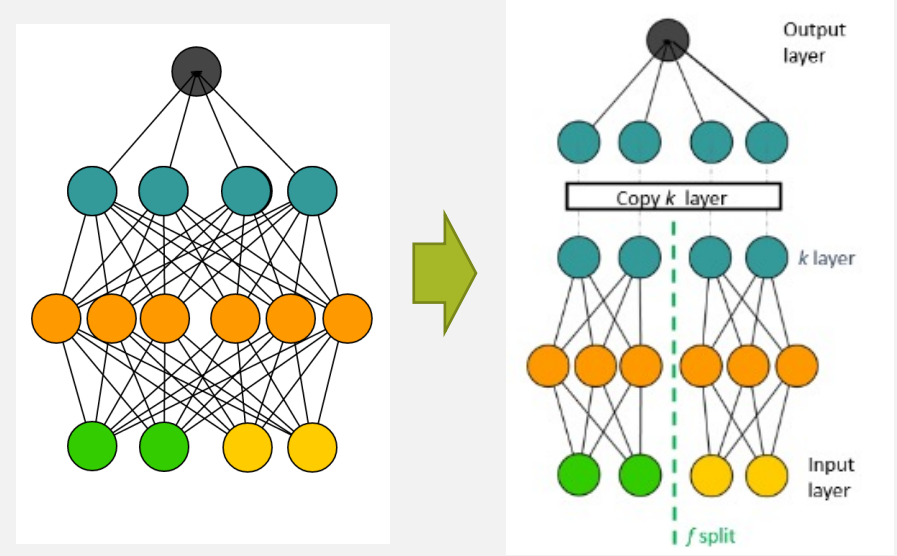




Model evaluation

How do we visualize and incorporate the prediction model in practice?

Vertical Split Learning



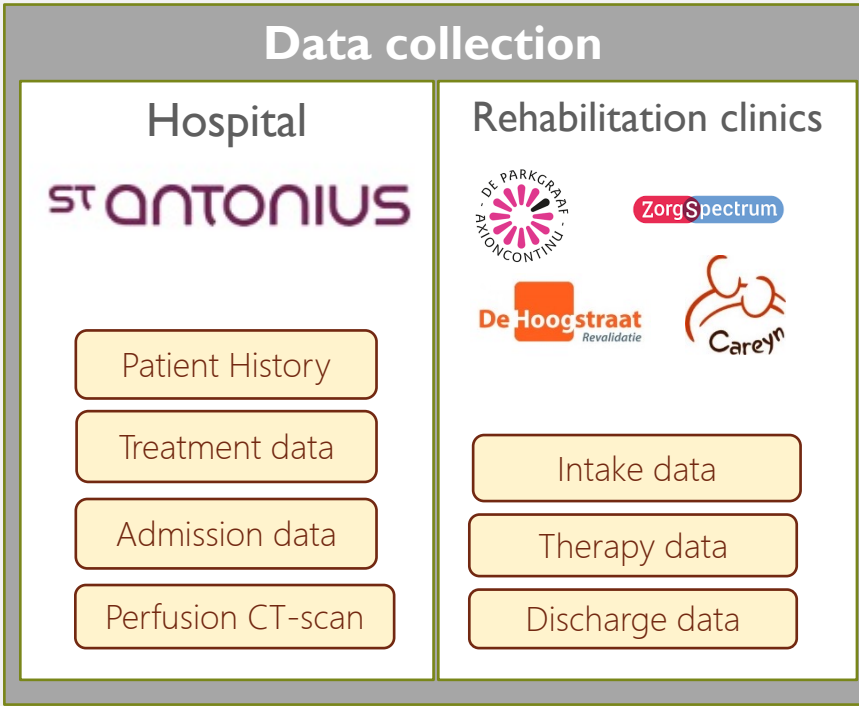
Vertical federated learning

How do we develop a model that is suitable for vertically partitioned data?



- Adapted and evaluated on range of datasets
- Often performs comparable to centralized learning
 - Exceptions in certain feature and network distributions

More information in "Vertical Split Learning: A suitable alternative for data centralization?" at ICTOpen2022



Model evaluation

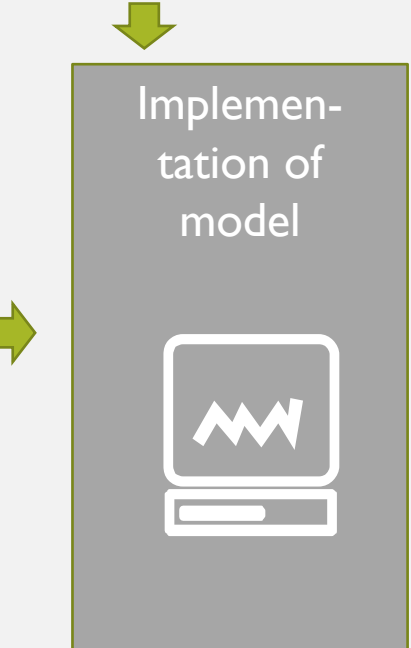
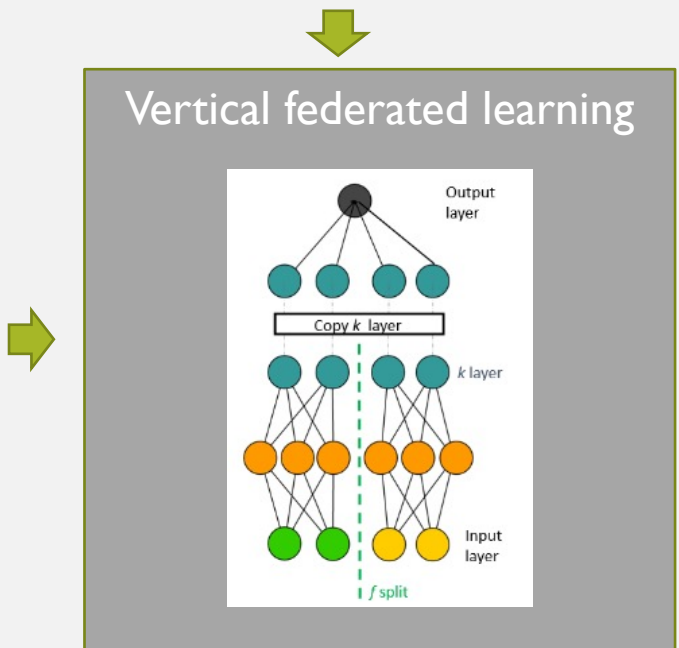
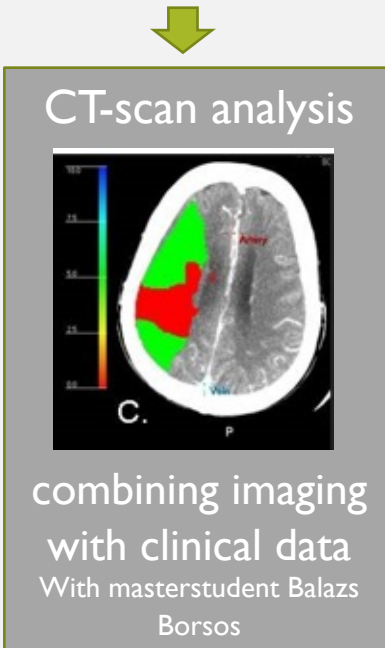
How do we visualize and incorporate the prediction model in practice?

Model evaluation

How do we visualize and incorporate the prediction model in practice?

Focusgroups with CVA patients and clinicians

1. Evaluation of information and decision making in current care
2. Discussion on the implementation of the prediction model in practice



Patient info
 Naam: Jan Janssen
 Leeftijd: 01-01-1940

Keuzehulp ingevuld: JA
 Keuze revalidatiekliniek: Geriatrische revalidatie (GRZ)

Bijdrage van eigenschappen patiënt

- Leeftijd = 82
- Geslacht = M
- Type CVA = Infarct
- Revalidatiekliniek = GRZ
- Behandeling = IVT
- Mantelzorger = NEE
- NIHSS = 10

MrS score:
 0 = geen symptomen
 1 = geen significante handicap
 2 = lichte handicap
 3 = matige handicap
 4 = matig zware handicap
 5 = ernstig zware handicap
 6 = overleden

Balk
 Rood = draagt bij aan slechtere uitkomst
 Groen = draagt bij aan betere uitkomst
 Leraar balk = hoeveel de eigenschap bijdraagt

IVT
 Intraveneuze trombolysie

NIHSS
 Meet symptomen bij opname, op een schaal van 0 tot 42.
 <5 : Beperkt CVA
 5-14 : Matig ernstig CVA
 15-25 : Ernstig CVA
 >25 : Zeer ernstig CVA

Voorspellingen (kans op uitkomst)

→ MrS Score (functionele status)

■ 0 tot 1 ■ 2 tot 3 ■ 4 tot 6

Dagen in revalidatiekliniek

■ < 2 weken ■ < 2 maanden ■ > 2 maanden

With masterstudent Sanne van Houwelingen

Data collection

Hospital

ST ANTONIUS

Patient History

Treatment data

Admission data

Perfusion CT-scan

Rehabilitation clinics



ZorgSpectrum

De Hoogstraat
Revalidatie



Intake data

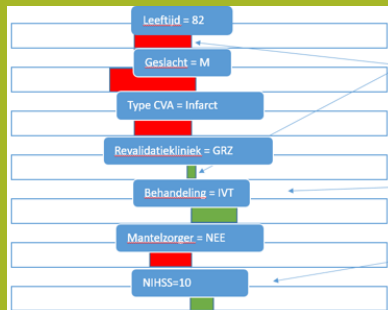
Therapy data

Discharge data

Model evaluation

How do we visualize and incorporate the prediction model in practice?

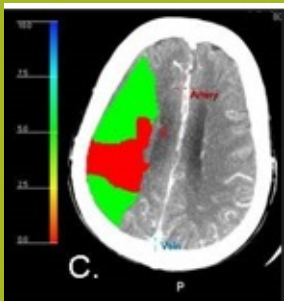
Focusgroups with patients and CVA clinicians



With masterstudent Sanne van Houwelingen

Any questions?

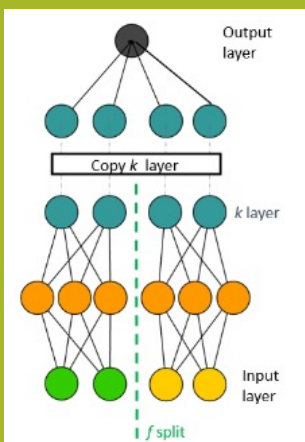
CT-scan analysis



combining imaging with clinical data

With masterstudent Balazs Borsos

Vertical federated learning



Implementation of model

