

ArgusBoard for Pattern Clustering and Classification

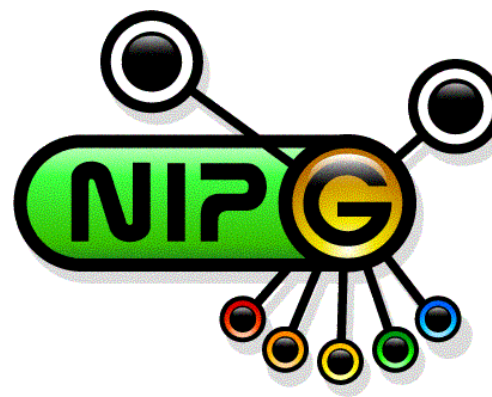
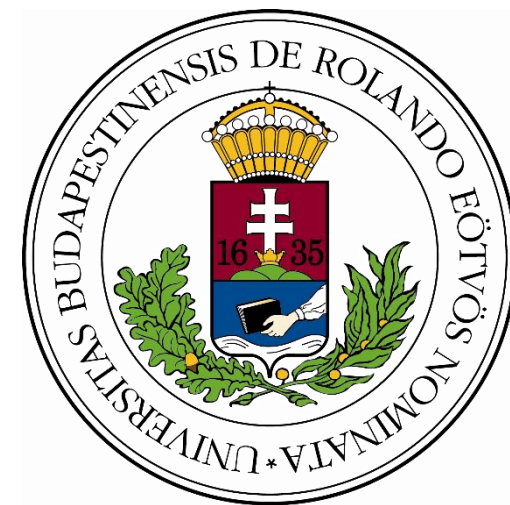
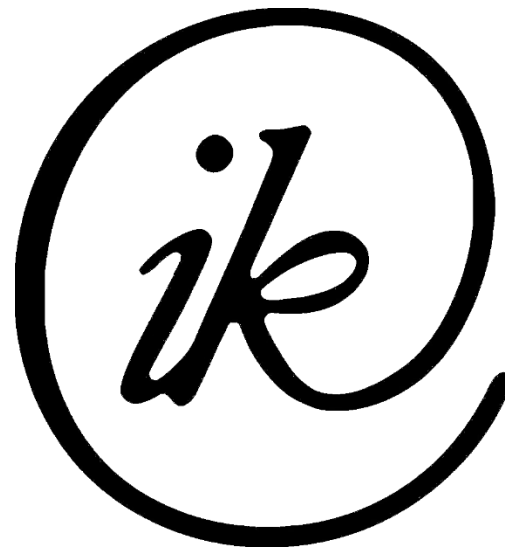
AI tools for the minimization of expert interaction

Demonstration:

"Which one is the child?"

Presenter: Kinga Bettina Faragó

Authors: K.B. Faragó, Á. Fóthi, E. Téglás, and A. Lőrincz



Európai Unió
Európai Szociális
Alap

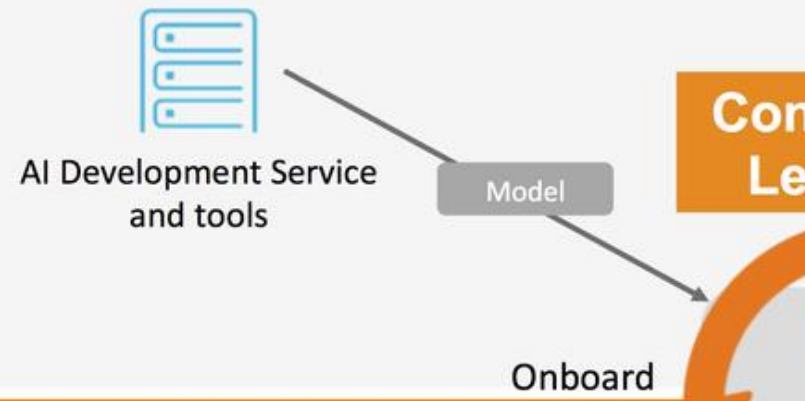


BEFEKTETÉS A JÖVŐBE

SZÉCHENYI 2020

ACUMOS

1 Create & On-Board Models



ework for data scientists to build that future.

[illegible]

ONAP accelerates the development of a vibrant ecosystem around a globally shared architecture and implementation for network automation

Acumos is the go-to site for data-powered automation. Acumos brings AI into the mainstream.

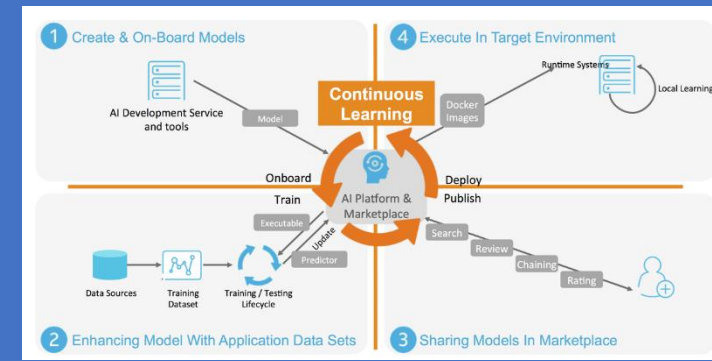
is a network architecture approach that enables the network to be intelligently and centrally controlled, or ‘programmed,’ using software applications. This helps operators manage the entire network consistently and holistically, regardless of the underlying network technology.

Acumos is the go-to site for data-powered decision making. With an intuitive easy-to-use Marketplace and Design Studio, Acumos brings AI into the mainstream.

Acumos converts models to microservices. You can apply them to different problems and data sources.

ACUMOS in keywords

- **Abstract AI models**
 - Models can be easily **onboarded** and wrapped
- Toolkit-independent 'App Store', called **Marketplace**
 - data-powered decision making and artificial intelligence software models
- **Design Studio** can be used to chain together multiple models
- **Data Broker** provides capabilities for acquiring data from external sources
- Acumos platform is available under an OSI-approved open source license



BUT: Options for flexible expert interaction are missing from Acumos.

Procedure for developing a „new detector”

Interaction

Step 1: Collect videos in a folder (not shown)

Step 2: Launch the software – here: face detector & pose detector

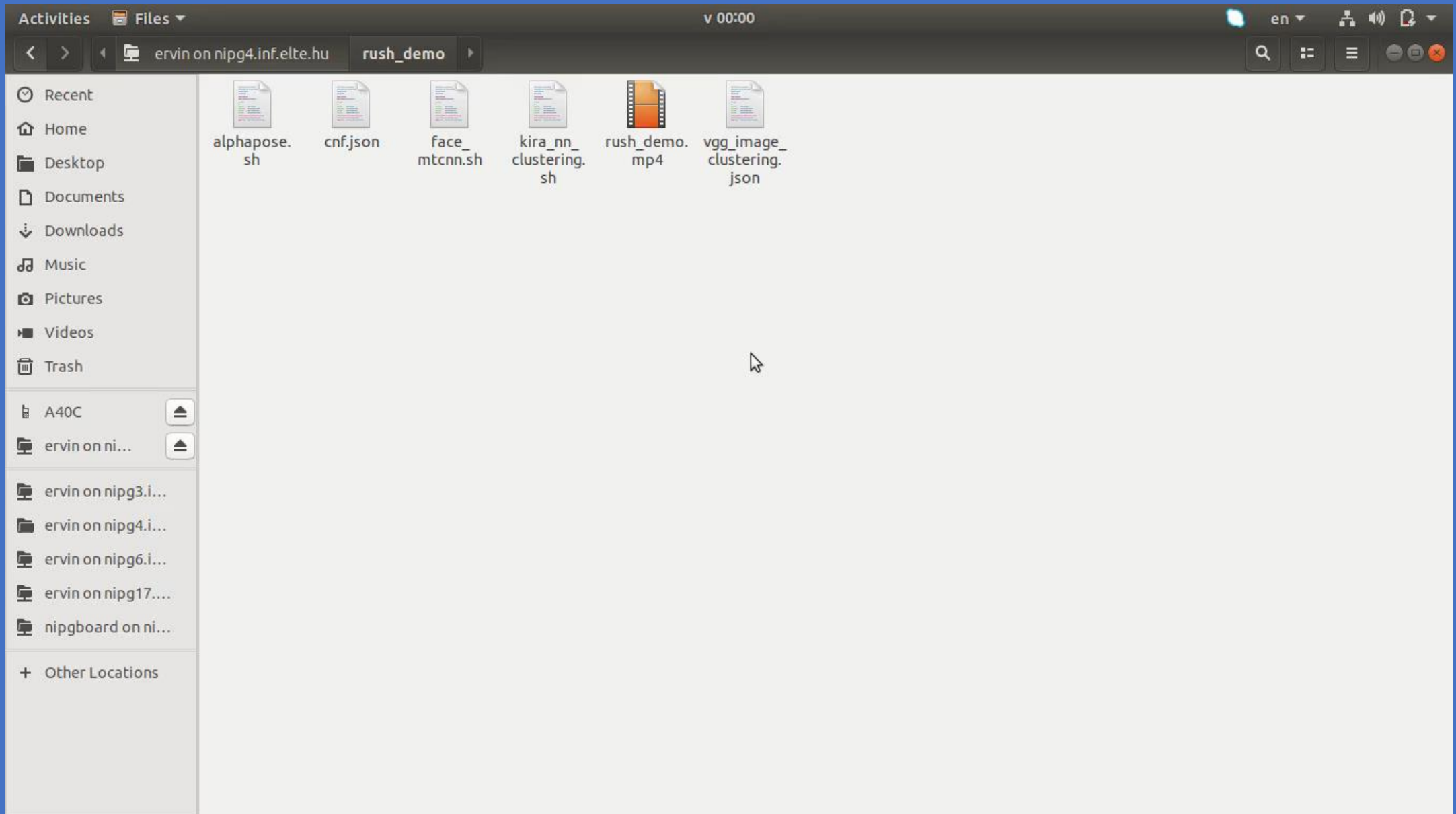
Step 3: Examine low dimensional embedding

Step 4: Select region(s)

Step 5: Include and deselect

Step 6: Sort and check (use video if needed)

Step 7: Check classification, fix errors if needed



Step 1: Collect videos in a folder

Argus Board

ALGORITHMSVIDEOKIRAPROJECTOR

INACTIVE

algorithms

Select an algorithm to add


VGG16 Clustering

ADD

RUN

Progress notifications

video



00:00:00.000 / 00:00:15.000

Choose video: rush_demo

x1

Step 2: Checking overlays

Argus Board

ALGORITHMS VIDEO KIRA PROJECTOR

INACTIVE

algorithms

Select an algorithm to add

VGG16 Clustering

ADD RUN

Progress notifications

video

00:00:07.342 / 00:00:15.000

Choose video: rush_demo

x1

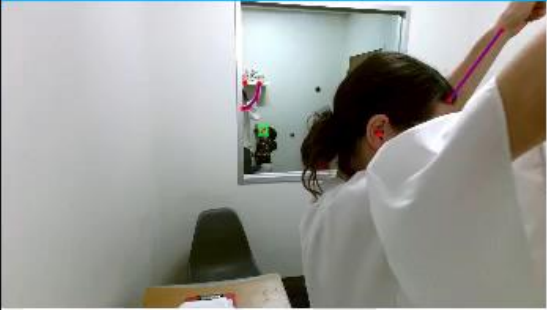
Step 3: Choosing clustering algorithm

Argus Board

ALGORITHMSVIDEOKIRAPROJECTOR

INACTIVE

video



00:00:00.000

kira

Create Kira Group

projector

DATA

1 tensor found
VGG16_Generated_Image_Embedd

Label by
Filename

Color by
No color map

Edit by
Filename

Tag selection as

LoadDownloadLabel

☒ Sphereize data

Checkpoint: /home/ervin/rush_demo2/vgg16_image_embedding.ckpt-1

Metadata: /home/ervin/rush_demo2/vgg16_metadata.tsv

T-SNEPCA

X
Component #1

Y
Component #2

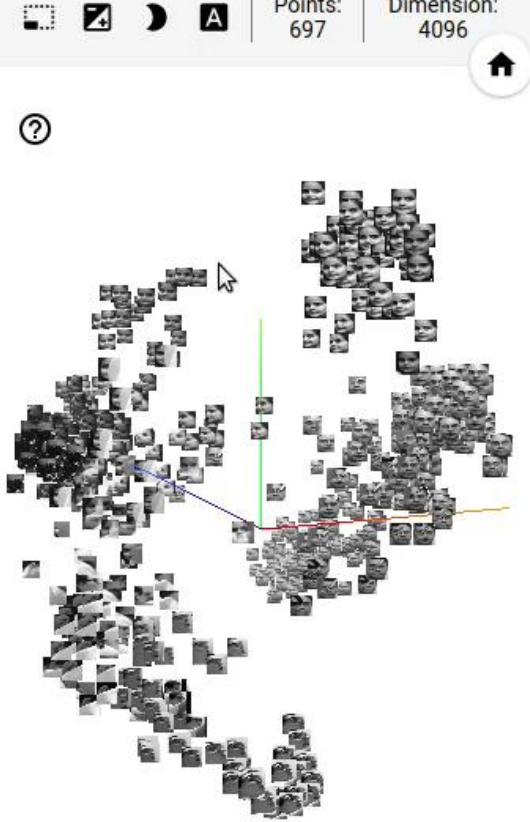
Z
Component #3

PCA is approximate.

Total variance described: 52.6%.

Points: 697

Dimension: 4096



Show All DataNo points selectedClear selection

by
Search

by
Filen...

BOOKMARKS (0)

Step 4: Check low dimensional embedding & select region

Argus Board

ALGORITHMS

VIDEO

KIRA

PROJECTOR

INACTIVE

video

kira

Create Kira Group

projector

DATA

algorithms

Select an algorithm to add

VGG16 Clustering

ADD RUN

Progress notifications

Points: 697

Dimension: 4096

Selected 40 points

Show All Data

Isolate 40 points

Clear selection

Search

by

File...

face_rush_frame126_face2.png

face_rush_frame151_face2.png

face_rush_frame192_face4.png

face_rush_frame195_face3.png

face_rush_frame198_face3.png

face_rush_frame215_face4.png

face_rush_frame216_face4.png

face_rush_frame218_face4.png

face_rush_frame219_face4.png

face_rush_frame223_face2.png

face_rush_frame224_face4.png

face_rush_frame225_face4.png

face_rush_frame226_face2.png

face_rush_frame226_face4.png

face_rush_frame228_face3.png

face_rush_frame229_face3.png

BOOKMARKS (0)

Step 5: Select positive and negative samples & select second algorithm

Argus Board

ALGORITHMSVIDEOKIRAPROJECTOR

INACTIVE

projector

algorithms

Select an algorithm to add

Kira NN Clustering

X

KIRA NN CLUSTERING

ADD

RUN

Kira NN Clustering

Clusternig based on KL Divergence and Pairwise relations.

Input Database

face_bounding_box

Execution Model

Train anew

Grand Truth

Kira Plugin Pairwise Relati...

Progress notifications

Points: 697 | Dimension: 4096

Show All Data

No points selected

Clear selection

by

Search

Filen...

BOOKMARKS (0)

Step 6: Final checking

Minimization of human interaction

Methods:

- 1) Selection of **Region of Interest** – here: bounding box (ready)
- 2) Deep multiple **instance learning** (to be included)
- 3) **Instance clustering** (to be included)
- 4) **More automation** *here*: preclustering via age estimation (to be included)
- 5) **More automation** *here*: classification according to similarities and age (to be included)
- 6) **Low dimensional embedding** for visualization (ready)
- 7) **Human expert** quality assurance (ready)

Ongoing studies

- Medical images/videos and brain signals – MRI/CT/EEG
- Situations – episodes – monitoring



**Thank
you**

for your

attention!

Contact: kinga.farago@gmail.com