

Samsung R&D Institute
Ukraine

Dual Education program “Mathematical Methods in Artificial Intelligence”

31/05/2022

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- ▶ Dual Education
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Andrey Fisunenko
(CTO)



Andrii Kovalchuk
(Dual Education coordinator)

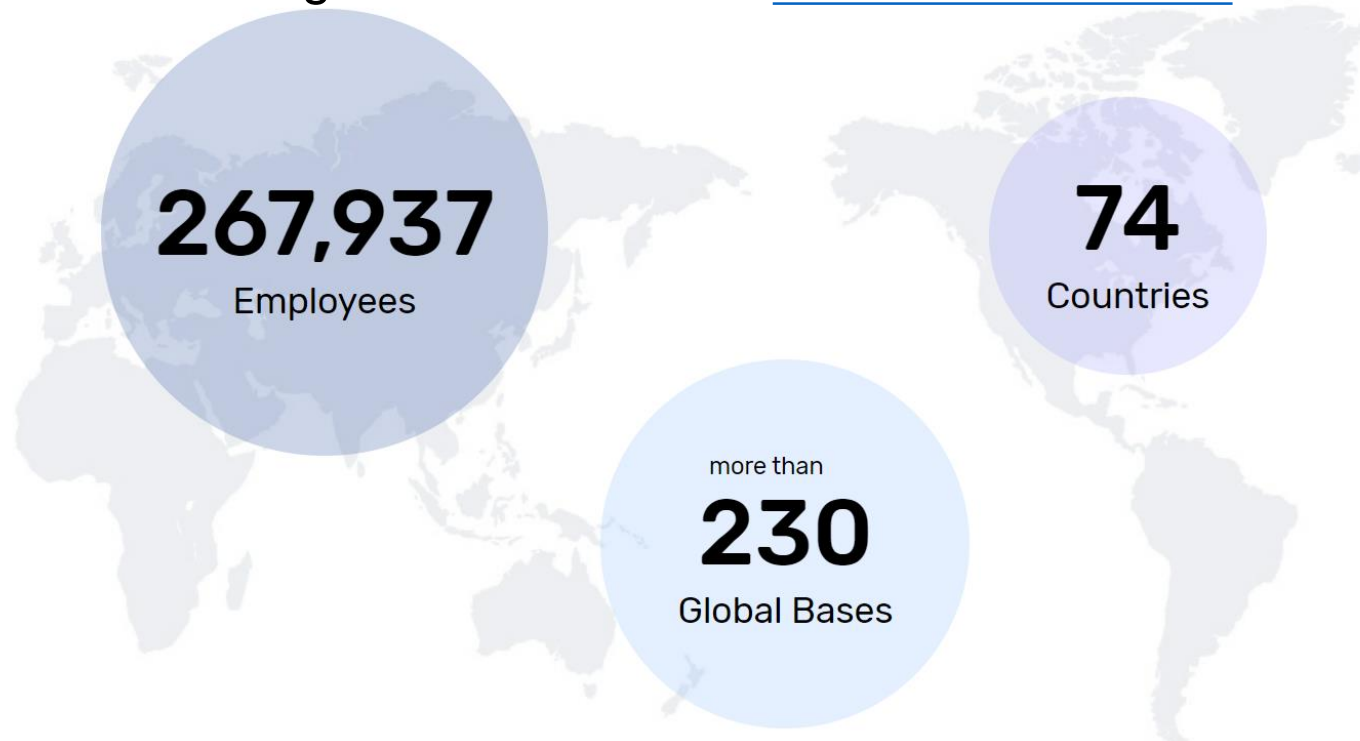


Pavlo Zakala
(engineer, MMAI
alumnus)



Anastasiia Cherneha
(engineer, MMAI alumnus)

Samsung is in TOP-5 of the [Best Global Brands](#)



15

Regional Offices



36

Production Sites



39

R&D Centers



7

Design Centers



53

Sales Offices

(as of December 2020)

DX

DS

DX (Device eXperience) Division

Visual Display
Business



Digital Appliances
Business



MX (Mobile
eXperience)
Business



Networks
Business



Health & Medical
Equipment
Business



DX

DS

DS (Device Solutions) Division

Memory Business



System LSI Business



Foundry Business



Samsung Research Ukraine History

Samsung Research
Kyiv, Ukraine

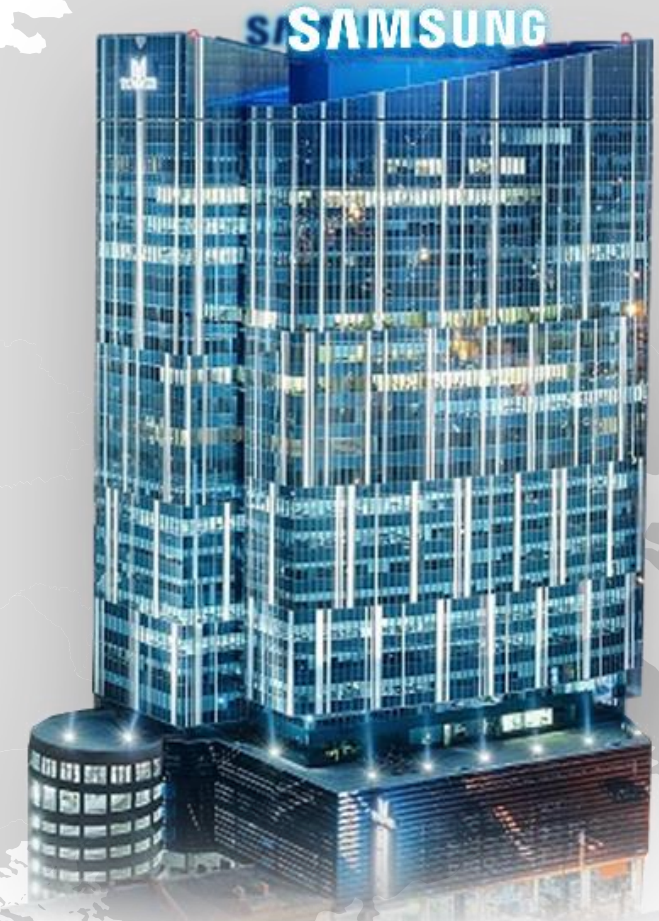
SR Ukraine is the R&D center focused on Artificial Intelligence & its applications for Cybersecurity, Augmented Reality & Robotics

2009

Established with focus in
Autonomous AI & Cybersecurity

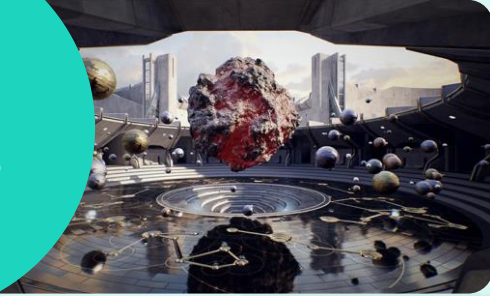
2022

In SR Ukraine Working
50% of SR Ukraine: +10Y tech domain experts



SRUKR office / "101 Tower" business center, Kyiv

3D/XR Graphics



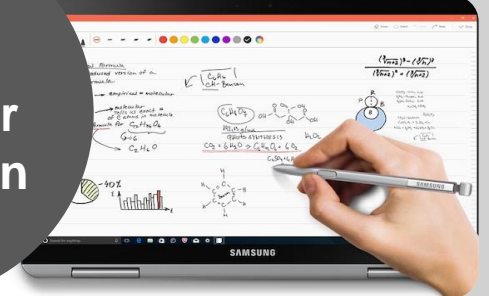
World 1st Vulkan Graphics on mobile

CV / ML + Multimodal



Smart Trainer Fitness App – TV 2021

Human Computer Interaction



World Best Handwriting Recognition

Game Graphics

- Game Engines Optimization
- Android Platform Solutions
- In-house Rendering Engines

AR/XR Graphics

- Stereoscopic Rendering
- Lens Distortion Correction
- TimeWarp / SpaceWarp

AR Core Vision Tech

- Visual Inertial Odometry
- Depth / Light Estimation
- 3D Scene Reconstruction

Applied CV/ML Tech

- Instance Recognition / Tracking
- Object Segmentation
- Human Activity Recognition
- Image Generation w/ GANs

Human Understanding

- Hand Gesture Recognition
- Eye Tracking
- Multi-modal Interaction

Text Intelligent Input

- Handwriting Text Recognition
- Shape / Math Recognition
- Optical Character Recognition

System Software



World 1st Mobile Certification

DTV Security

- TV management
- TV-side security solutions
- Threat monitoring, etc.

Mobile Security

- Secure OS
- Security components
- Kernel modules

AI for Cyber security



Intelligence Security

- Security threat analytics
- Security automation
- Adversarial AI, voice sec. etc.

Privacy Technologies

- Authentication
- Security OpenSource
- Critical events detection
- Sensitive data leak detection

Security Assessment



Penetration testing

- Device testing
- Cloud-side testing

Cybersecurity audits

- White cybersecurity review
- Pre-certification audits

- ▶ Dual Education – education that combines theory and practice through studying on a joint program developed and implemented by the university and the company



- ▶ Combining work & study
- ▶ Making top-level diploma that is related to work
- ▶ Scientific mentor in a company
- ▶ Research experience
- ▶ Writing article for TOP conferences



How to apply for SRUKR Internship

1

Send CV to

an.kovalchuk@samsung.com

- email subject "MMAI Dual Education / Name Surname"
- introduce yourself and why you apply

2

Receive and do a test task

3

Pass an interview to SR Ukraine

4

Pass exams at University (independent process)

5

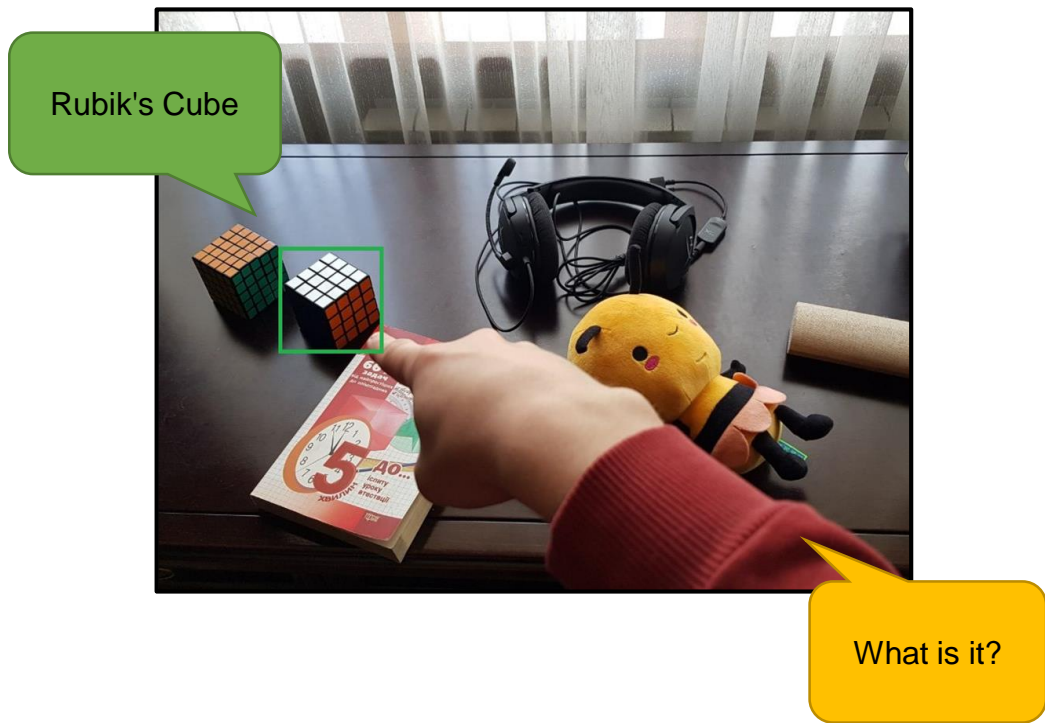
Common decision with SR Ukraine and University

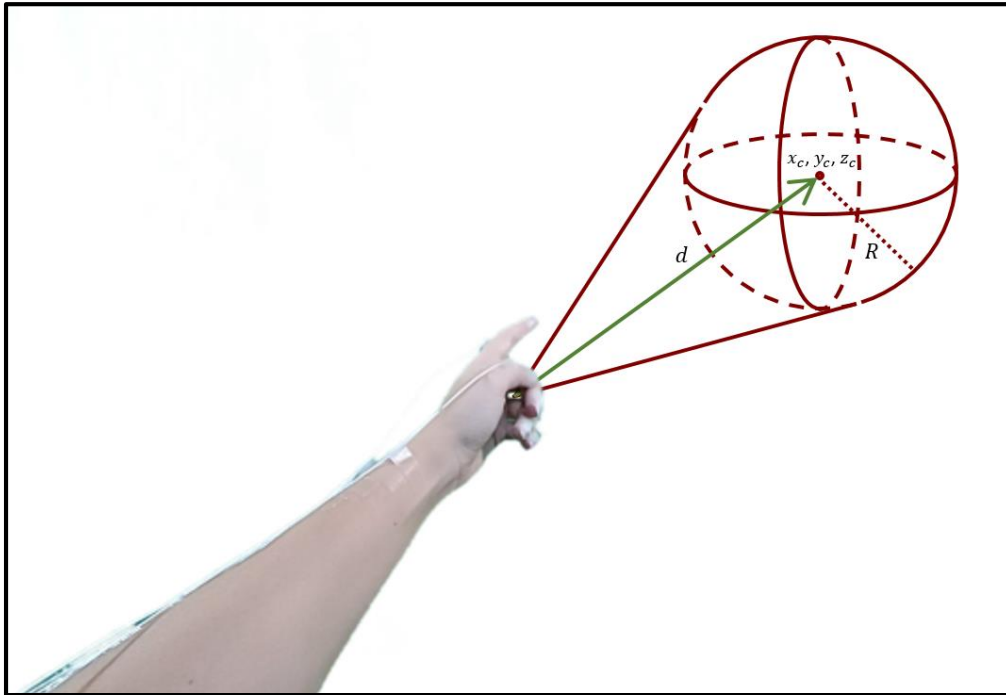
Author:

Pavlo Zakala

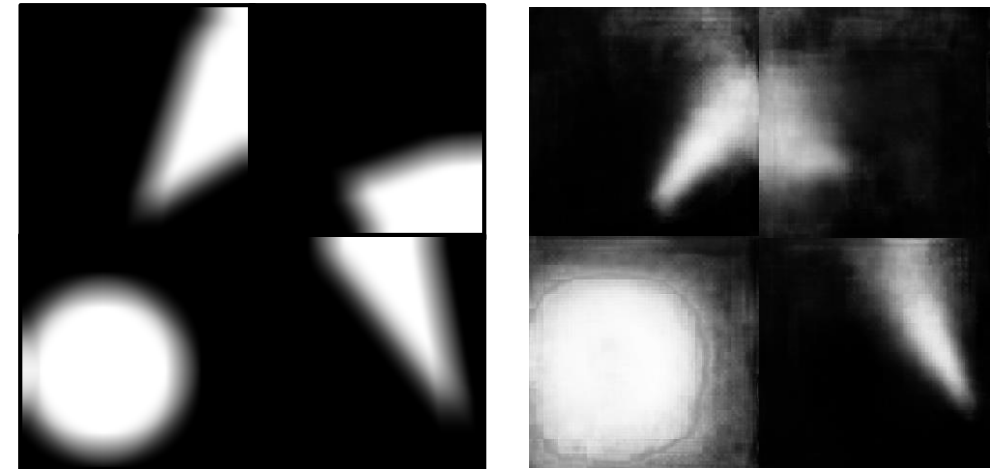
Topic:

Multimodal object detection under gestural supervision





Geometry model of ROI



ROI for hand

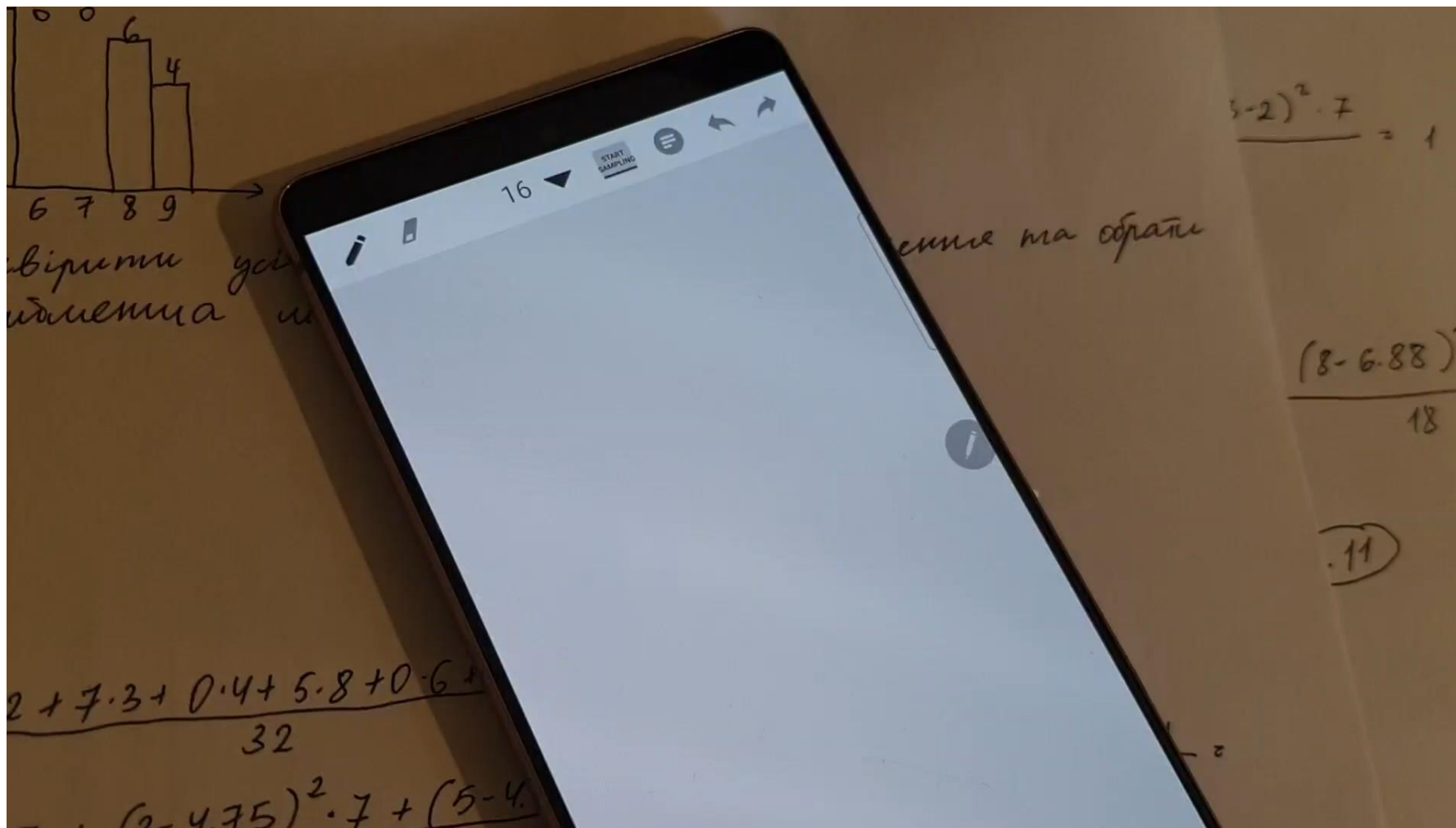
Author:

Anastasiia Cherneha

Topic:

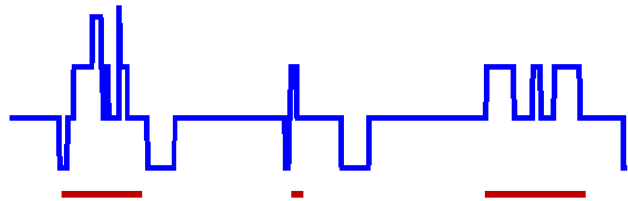
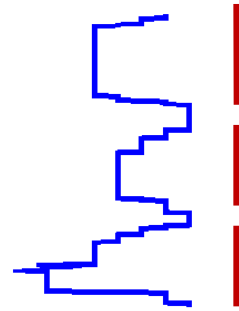
Segmentation Algorithms for Handwritten Tabular Structures

Segmentation Algorithms for Handwritten Tabular Structures



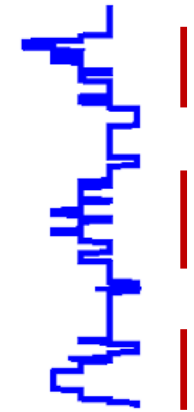
Modified method of projection profiling

$$\begin{pmatrix} 1 & 3 & \cos \theta \\ 0 & 1 & 0 \\ -\sin \theta & 0 & 1 \end{pmatrix}$$



$$\begin{pmatrix} 1 & 3 & \cos \theta \\ 0 & 1 & 0 \\ -\sin \theta & 0 & 1 \end{pmatrix}$$

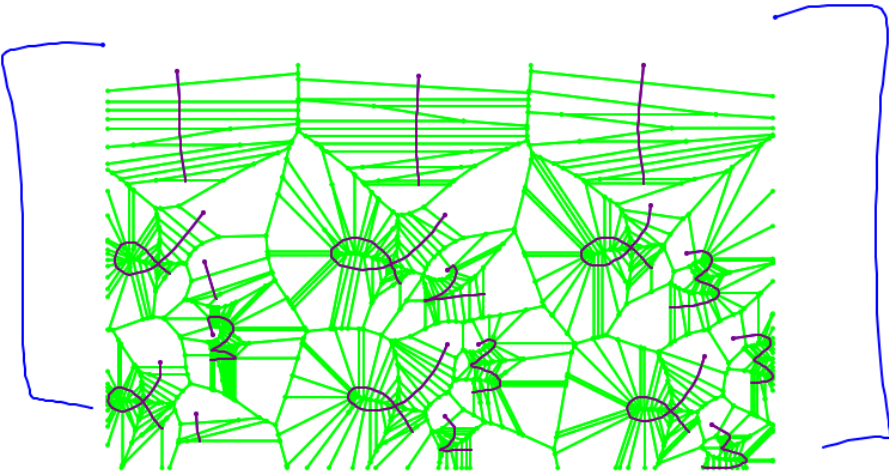
$$\begin{bmatrix} 0 & 6 & 1 & 6 \\ 0 & 6 & 1 & 6 \\ 0 & 6 & 1 & 6 \end{bmatrix}$$



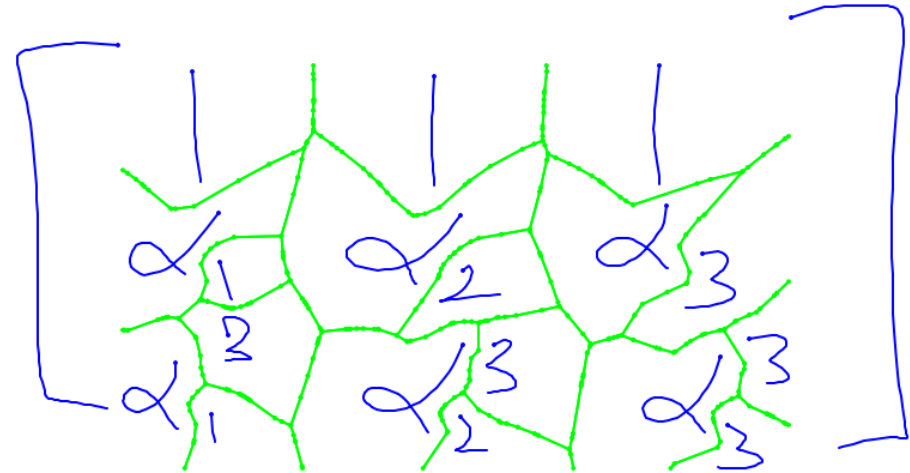
$$\begin{bmatrix} 0 & 6 & 1 & 6 \\ 0 & 6 & 1 & 6 \\ 0 & 6 & 1 & 6 \end{bmatrix}$$

Area Voronoi Diagrams

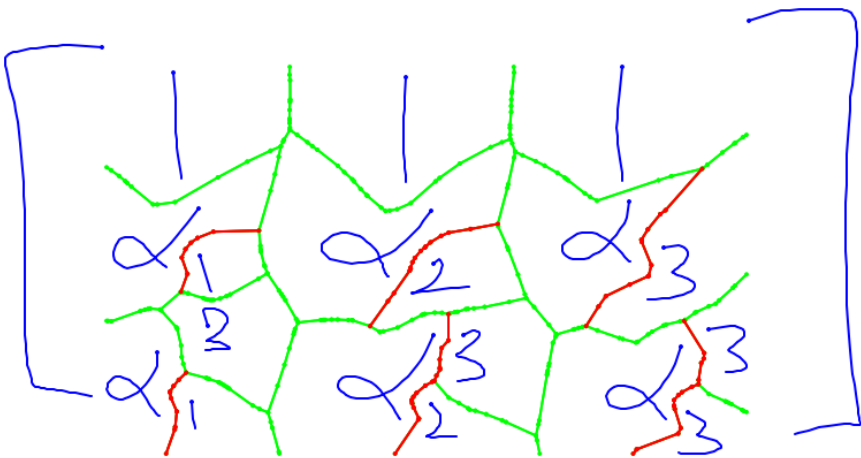
1)



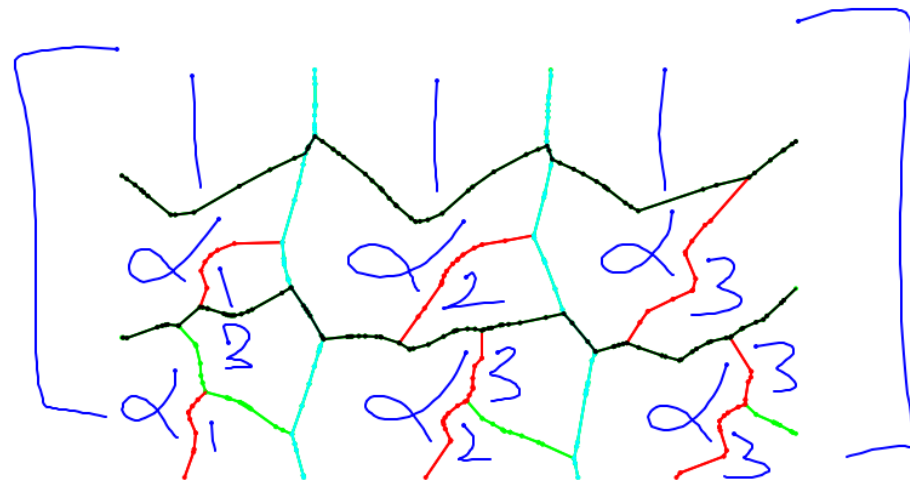
2)



3)



4)



Samsung Research

Kyiv, Ukraine

Welcome to SR Ukraine!

Question & answers?

