

Explainable AI via Argumentation: Theory & Practice

Antonis Kakas antonis@ucy.ac.cy

University of Cyprus, Cyprus

Nikos Spanoudakis nispanoudakis@tuc.gr

Technical University of Crete, Greece

Co-founders (with Pavlos Moraitis) of Argument Theory

<https://www.argument-theory.com/>

ESSAI 2024 School: 22-26 July, Athens

Lecture 3

raison : no-code AI

- Cloud Gorgias API usage
 - The API
 - An ophthalmological application
- raison platform presentation
 - Motivation
 - Platform presentation
 - Example problems
 - Clarification/completion of problem specification
 - Revision of problem specification
- Hands-on Development
 - Open student projects in raison
 - Discussion of SBPs for student problems

Gorgias API usage

Where a user application uses argumentation in the background



test

 **Community**

 **Documentation**

 **Contact**

[Gorgias-B tool](#)

[Learn Prolog](#)

[Gorgias Cloud tutorial](#)

[Gorgias tutorial](#)

[API Documentation](#)

cloudgorgias@amcl.tuc.gr



Swagger™
Supported by SMARTBEAR

Select a definition

default

Api Documentation 1.0

[Base URL: aiasvm1.amcl.tuc.gr:8085/]

<http://aiasvm1.amcl.tuc.gr:8085/v2/api-docs>

[Api Documentation](#)

[Terms of service](#)

[Apache 2.0](#)

Click and copy
the docs

```
1 swagger: '2.0'  
2 info:  
3   description: Api Documentation  
4   version: '1.0'  
5   title: Api Documentation  
6   termsOfService: urn:tos  
7   contact: {}  
8   license:  
9     name: Apache 2.0  
10    url: http://www.apache.org/licenses  
11       /LICENSE-2.0  
11 host: aiasvm1.amcl.tuc.gr:8085  
12 basePath: /  
13 tags:  
14 - name: execute-gorgias-query-controller  
15   description: Execute Gorgias Query  
16     Controller  
17 - name: operations-controller  
18   description: operations Controller  
18 paths:  
19   /GorgiasQuery:  
20   post:  
21     tags:  
22     - execute-gorgias-query-controller  
23     summary: Execute Gorgias Query  
24     operationId: executeQuery  
25     consumes:  
26     - application/json  
27     produces:  
28     - */*  
29     parameters:  
30     - in: body  
31       name: gorgiasQuery  
32       description: gorgiasQuery
```

Paste in swagger editor

execute-gorgias-query-controller

POST /GorgiasQuery executeQuery

operations-controller

POST /addFile addFile

POST /createProject createProject

POST /deleteFile deleteFile

POST /deleteProject deleteProject

POST /getFileContent getFileContent

POST /getProjectFiles getProjectFiles

Generate client in 50 programming languages

An ophthalmological application

With requirements from a real-world eye clinic

Ophthalmologica

Welcome, what are your main symptoms?

Please fill as many symptoms as you can in [Main form](#).



Main form

Patient Id:

23

zone impliquée

- A.oeil B.paupière C.voies lacrymales D.orbite E.non identifiable

symptome

- | | |
|---|---|
| 1. <input checked="" type="checkbox"/> trouble d'acuité visuelle(BAV) | 9. <input type="checkbox"/> photophobie/blépharospasme |
| 2. <input checked="" type="checkbox"/> oeil douloureux | 10. <input type="checkbox"/> sensation de corps étranger(SCE) |
| 3. <input checked="" type="checkbox"/> oeil rouge | |

contexte

- | | |
|---|--|
| 17. <input type="checkbox"/> lentille de contact | 23. <input type="checkbox"/> traumatisme orbite |
| 18. <input type="checkbox"/> corps étranger cornéen(suspecté) | 24. <input type="checkbox"/> traumatisme des paupières |
| 19. <input type="checkbox"/> chirurgie | 25. <input type="checkbox"/> traumatisme |

Ophthalmologica

Eye Disease: **Ulcère de cornée : non perforé avec implication stromale**

Severity level: **trois**

Your symptoms point towards the disease "**Ulcère de cornée : non perforé avec implication stromale**" and although the disease **Ulcère de cornée : défaut épithélial isolé** is also supported, in general, the evidence for "**Ulcère de cornée : non perforé avec implication stromale**" can be stronger.

Next Patient

rAISON platform presentation

raison : a no-code symbolic AI platform

- Argument theory is a start-up company of the University of Paris City with scientific co-founders
 - Pavlos Moraitis (CEO)
 - Antonis Kakas (CSO)
 - Nikolaos Spanoudakis (CTO)
- Argument Theory offers the *raison* professional platform, a no-code symbolic artificial intelligence (AI) development platform specializing in the modeling and development of automated decision-making systems.
- The AI technology behind the *raison* platform is computational argumentation

RAISON : an innovation engine

- Developers work at their application domain level by using their application expertise or knowledge to model their decision policies in their familiar application vocabulary
- Through a natural language dialogue with the RAISON platform, a developer is able, to naturally encode her/his own decision policies in the language of our inference engine without writing a single line of code.

Three reasons for adopting rAISON

- Transform personal use cases into applications
 - Personal use: individuals innovate by transforming their own use cases into applications
- Doing business with rAISON
 - Professional use: a developer who develops applications that may have general value can do business by offering, through the rAISON platform marketplace, their applications to other users, at the desired price
- Collective development for businesses
 - Business use: a company can form teams of developers and very quickly develop artificial intelligence applications, thus saving time and money

Democratizing the ability to create AI apps

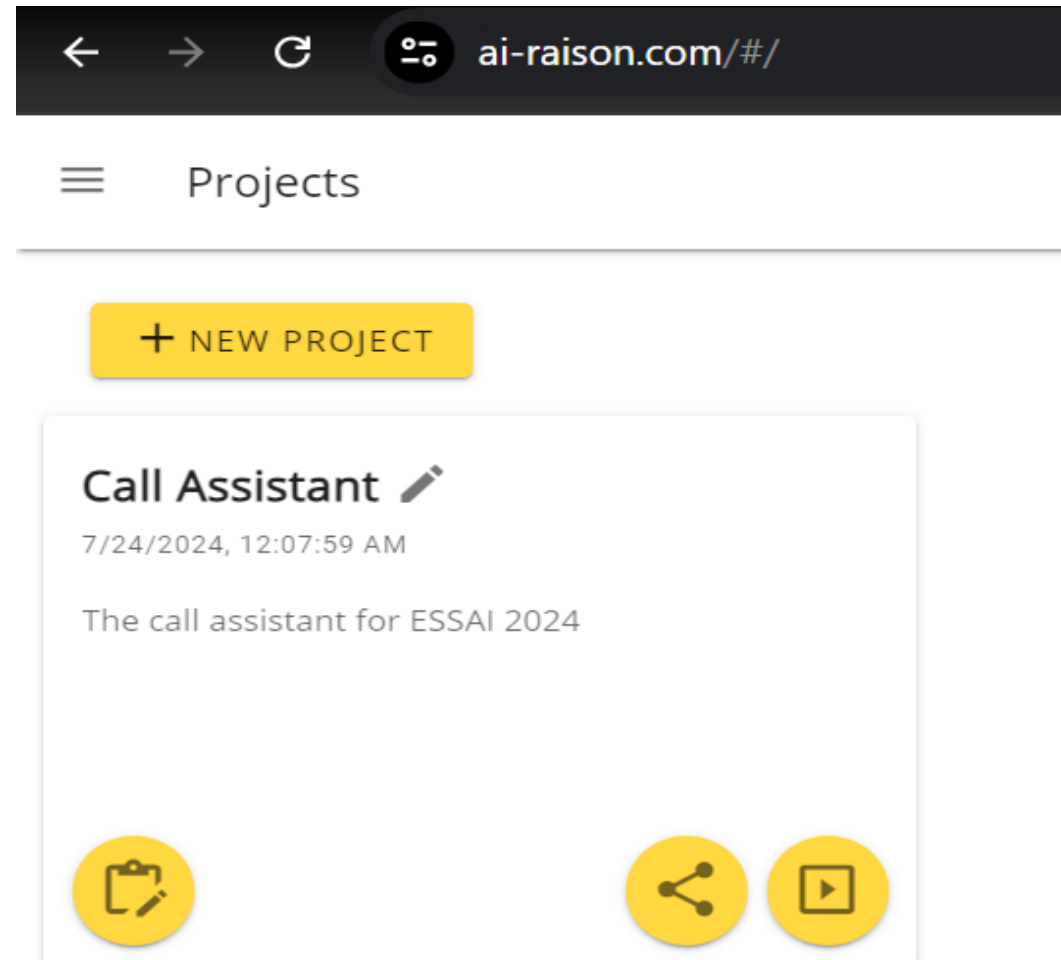
- The *raison* platform allows anyone to innovate by transforming their own use case into an application, or, for businesses to develop automated decision-making systems (or recommender systems) capable of assisting human decision-makers or delegating human decisions to these AI-based systems
- The applications developed can be used directly via our platform, through a device (e.g. mobile phone, PC) or be integrated into businesses IT environments and use the services of the reasoning system via the APIs provided by the SaaS platform

Authoring Apps in RAISON

Using the RAISON editor

Developing in basic mode

□ A call assistant



Developing in expert mode

- A seller agent
- “If I do not have enough quantity of the product in my warehouse I cannot sell. If I have it, then my primary choice is to sell at regular price. However, if the customer spent more than 200 euros in my store during the last month then I will sell at a promotional price. An exception to this is that during the high season I will still sell at regular price.”
- Options: sell at regular price, sell at promotional price, cannot sell

Sharing and running apps in RAISON

Using the RAISON environment

Hands on : RAISON

- Create accounts – for those not already done so
- Exercise 1: A Simple Seller agent in RAISON basic mode
 - Options: sell high, sell low
 - Normally sell high. However, for a regular customer then can sell low. Also, when the customer wants to buy a large quantity then can sell low. During the high season still/always sell high, except for promotional products.

Hands on project

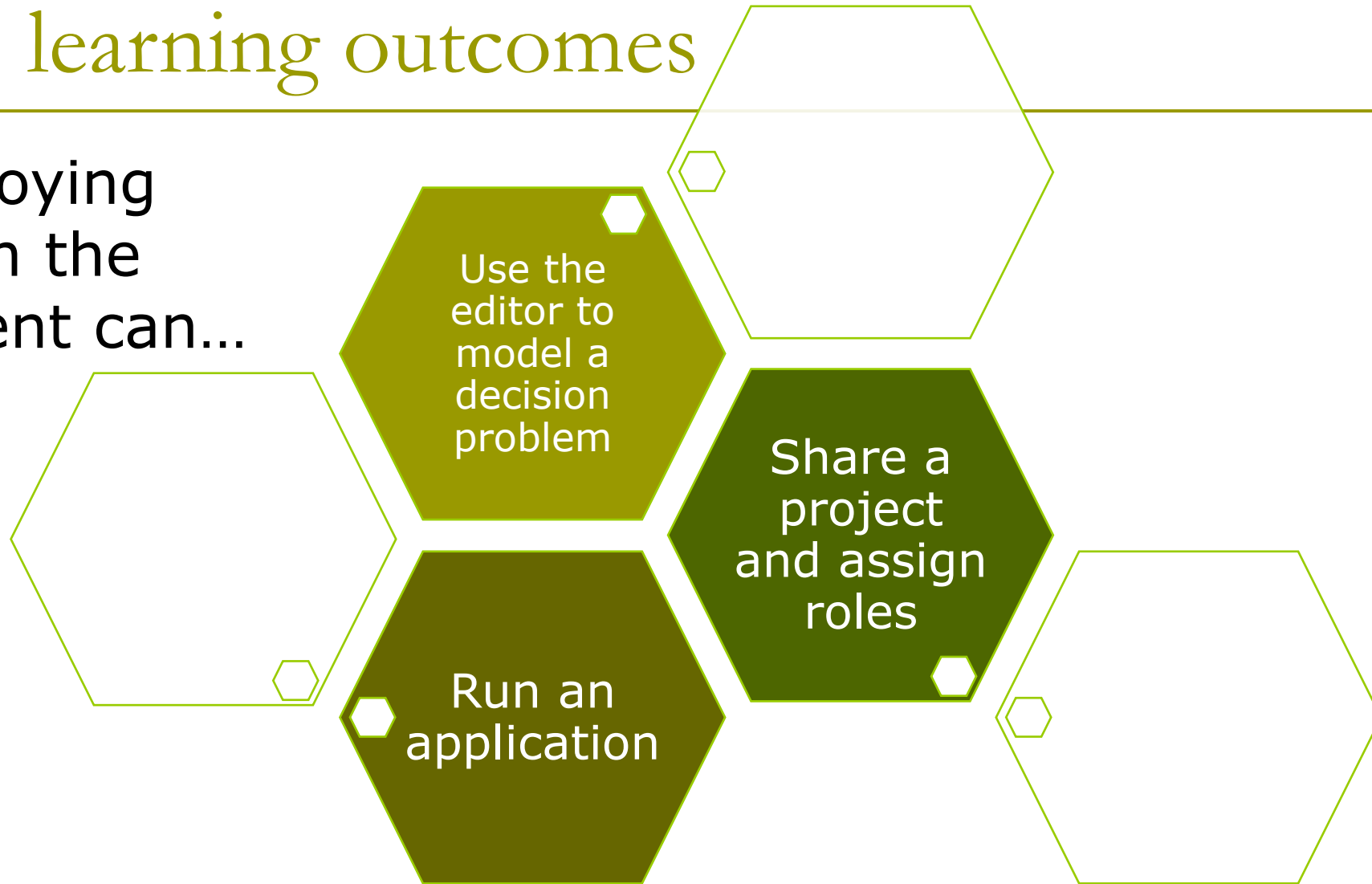
- Finalize the hierarchies of SBPs for your project policy
 - Submit them to our emails with subject "Hands on – day 3"
- Start your projects on RAISON
 - Share your projects with our emails

Further study by your self on how to use RAISON

Take a look at the demo use cases in the youtube channel
<https://www.youtube.com/@Argument-Theory>

Day 3 learning outcomes

□ Employing RAISON the student can...



Further reading

- ❑ Spanoudakis, N., Kakas, A. C., & Koumi, A. (2022). Application Level Explanations for Argumentation-based Decision Making. In ArgXAI@ COMMA.
- ❑ Spanoudakis, N. I., Gligoris, G., Kakas, A. C., & Koumi, A. (2022). Gorgias cloud: On-line explainable argumentation. In Computational Models of Argument (pp. 371-372). IOS Press.
- ❑ Tanos, P., Yiangou, I., Prokopiou, G., Kakas, A., & Tanos, V. (2024, January). Gynaecological Artificial Intelligence Diagnostics (GAID) GAID and Its Performance as a Tool for the Specialist Doctor. In Healthcare (Vol. 12, No. 2, p. 223). MDPI.