



DATA PREPROCESSING



PETRA KAMENSKÁ



CROWDSOURCING

COLLECTIVE INTELLIGENCE

CROWD WISDOM

WELCOME TO THE ZOONIVERSE

People-powered research

CATION

NOTICE
KEEP THIS
DOOR CLOSED

MY PROJECT

[PROJECTS](#)[ABOUT](#)[GET INVOLVED](#)[TALK](#)[BUILD A PROJECT](#)[NEWS](#)[NOTIFICATIONS](#)[MESSAGES](#)[PETRA.KAMENSKA ▾](#)

Detekcia TLE

[ABOUT](#)[CLASSIFY](#)[TALK](#)[COLLECT](#)[RECENTS](#)

Automatická detekcia TLE na
snímkach AMOS pomocou
hlbokého učenia

[Learn more](#)[Get started](#)

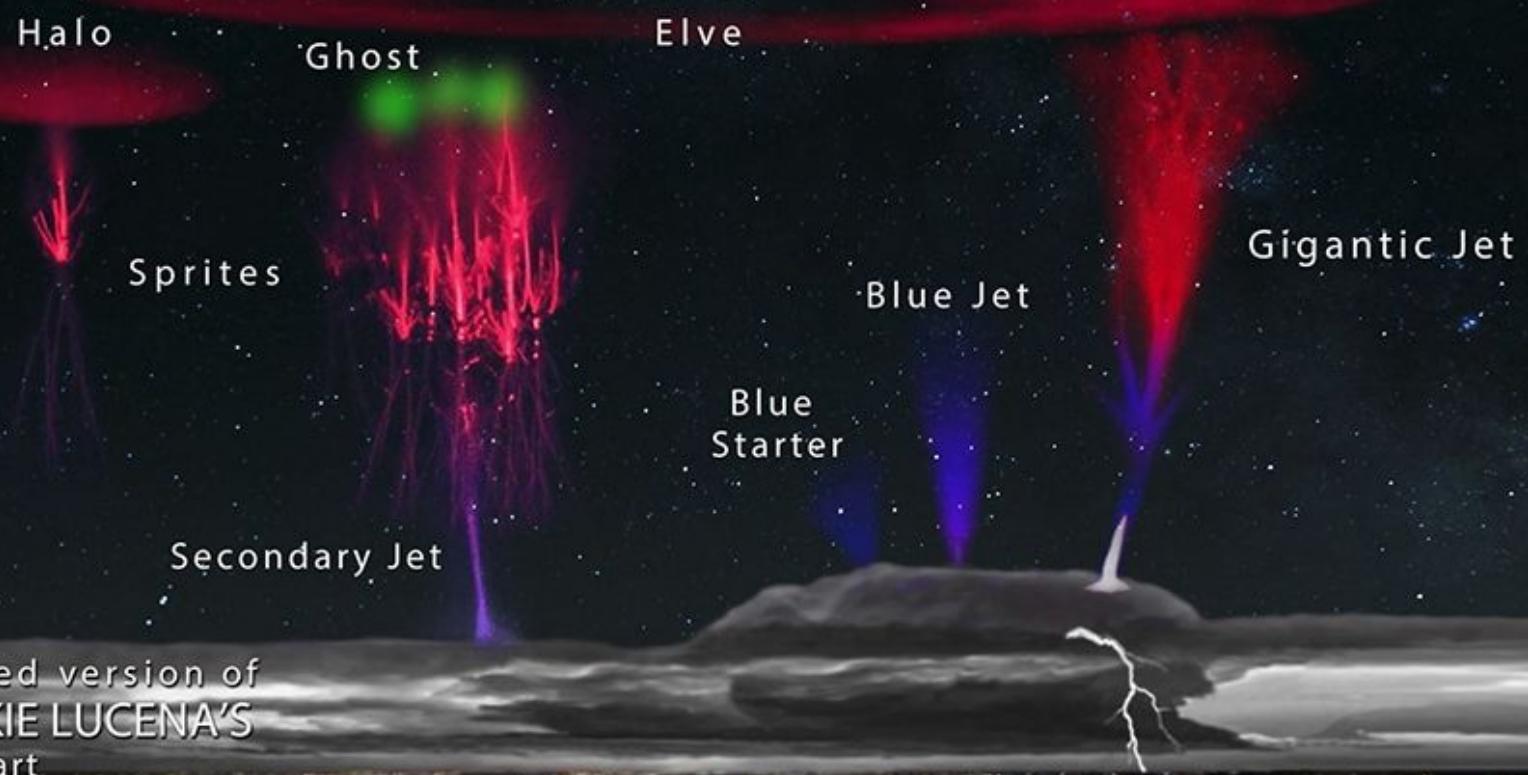
<https://www.zooniverse.org/projects/petra-kamenska/detekcia-tle>

Načo je zameraný tento anotačný projekt a čo je vašim cieľom??

Vašim cieľom je z obrovského množstva dát - snímok z kamery AMOS vytriediť tie, na ktorých sa nachádzajú nadoblačné blesky TLE, označiť ich a zatriediť do typov. Takto vytriedené dáta budú použité pri následnom učení umelej inteligencie.

Metódy hlbokého učenia sa stávajú najúčinnejšími prístupmi v oblasti počítačového videnia. Jedna zo základných úloh kde sú tieto algoritmy veľmi efektívne je detekcia nepravidelných a sporadických štruktúr. Práve preto sú veľmi vhodné pre vesmírny výskum, kedy je vo veľkom množstve dát potrebné detegovať špecifické udalosti. Takými sú nadoblačné blesky (Transient Luminous Events), ktoré je možné pozorovať pomocou celooblohouvých kamier AMOS.

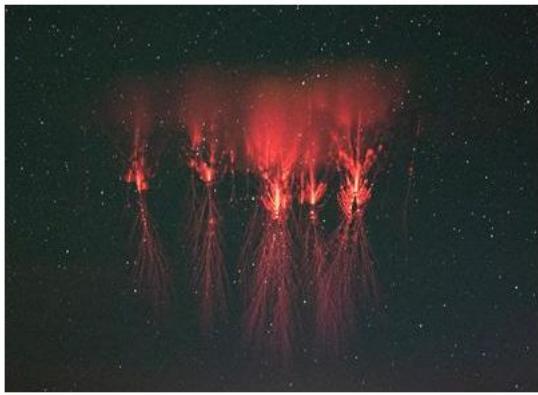
Transient Luminous Events (TLEs)



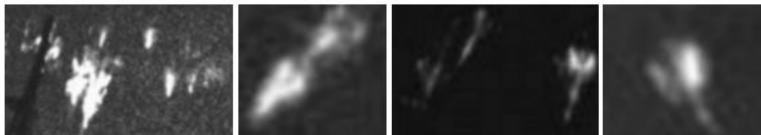
ABOUT

WHAT WE ARE LOOKING FOR?

1. Mrkva (Carrot sprite)



- vyzerá naozaj ako mrkva s vňačou
- má užší stred, ktorý je na fotkách najjasnejší
- väčšinou ide o zoskupenie viacerých
- na oboch koncoch je rozšírená
- vyskytuje sa voľne vo vzduchu, nie je spojená s oblakom



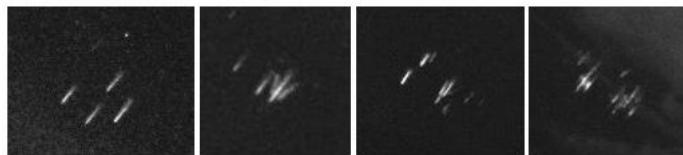
Carrot

Column

2. Stíp (Column sprite)



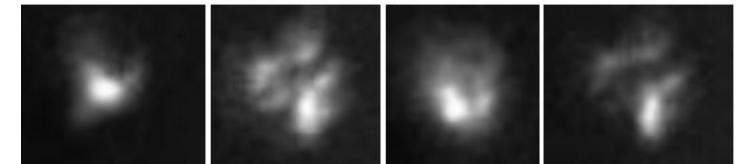
- vyzerá ako rozsypané špáradlá
- úzke po celej dĺžke
- väčšinou ide o zoskupenie viacerých
- vyskytuje sa voľne vo vzduchu, nie je spojená s oblakom



3. Fontána (Jet, Starter)



- vyzerá ako vystrekujúca voda
- dole je užšia a smerom hore sa rozširuje
- začína z oblaku, takže ju hľadaj úplne na kraji
- keďže je spojená s oblakom podobá sa na machuľu



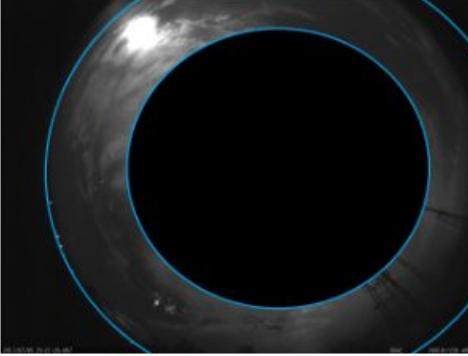
Jet

READ THE TUTORIAL !

1. Krok

V prvom kroku uvidíš snímok z celooblohoej kamery AMOS. **Priblíž si obrázok a poriadne si ho prezri!** Vidíš tam nejaké nadoblačné blesky *TLE*? Hľadaj ich hlavne po obvode snímky!

Medzi dvoma modrými vyznačenými kružnicami na obrázku.



Ak áno, vyznač možnosť "áno" a pokračuješ ďalej. Ak nie, vyznač možnosť "nie" a Zooniverse ti vygeneruje ďalší snímok z datasetu.

[Continue](#)

◀ ● ○ ▶

2. Krok

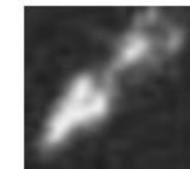
V tomto kroku bude tvojou úlohou označiť TLE blesk, ktorý si spozoroval/a. **POZOR!** Ak ich je na obrázku viac, označ ich všetky.

Najprv vyber o aký druh TLE ide, klikni naň, prejdí s kurzorom na obrázok a vytvor štvorček okolo blesku.

Ako TLE blesky vyzerajú?

1. Mrkva (Carrot sprite)

- vyzerá naozaj ako mrkva s vňaťou
- má užší stred, ktorý je na fotkách najjasnejší
- väčšinou ide o zoskupenie viacerých
- na oboch koncoch je rozšírená
- vyskytuje sa voľne vo vzduchu, nie je spojená s oblakom



Let's go!

◀ ○ ● ▶

1. STEP



2020/04/23 02:19:34.918

TASK

TUTORIAL

Vidíš na obrázku nejaký TLE?

Áno

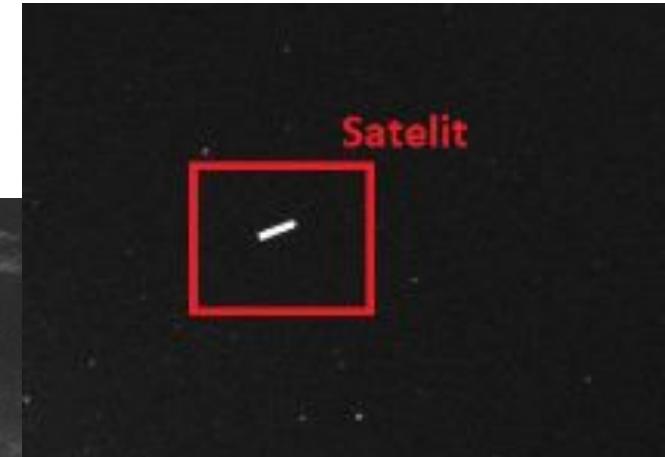
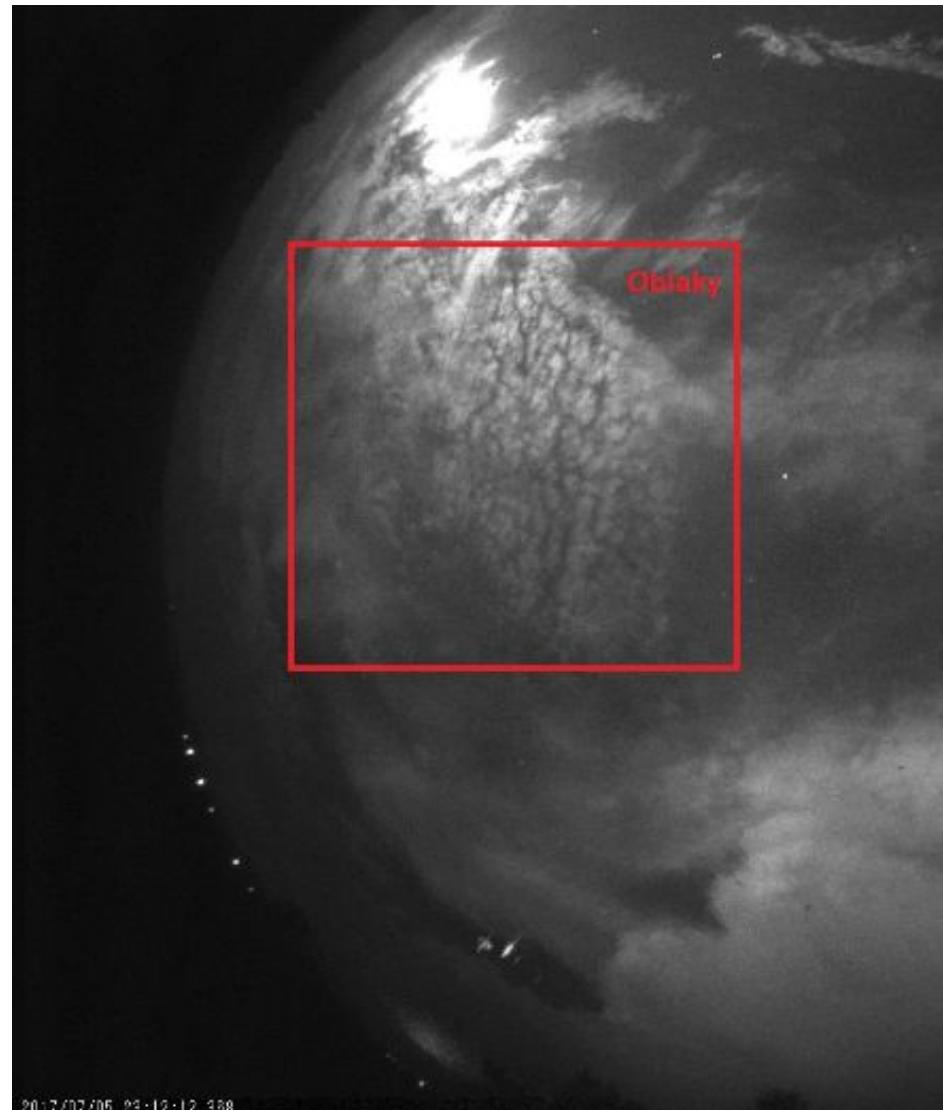
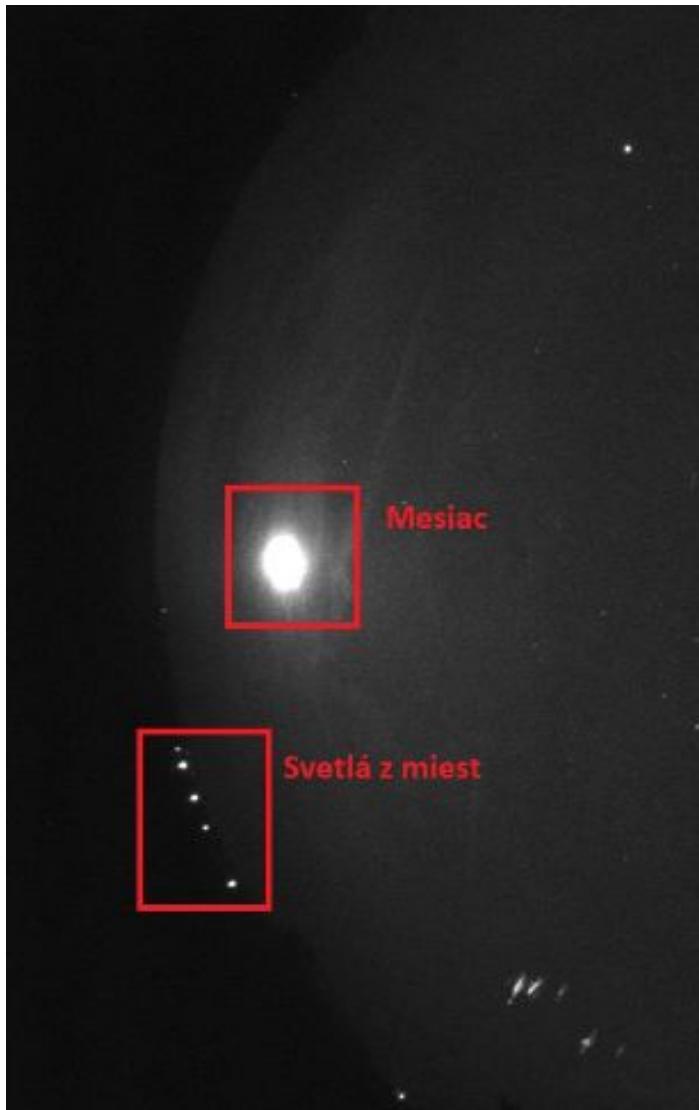
Nie

NEED SOME HELP WITH THIS TASK?

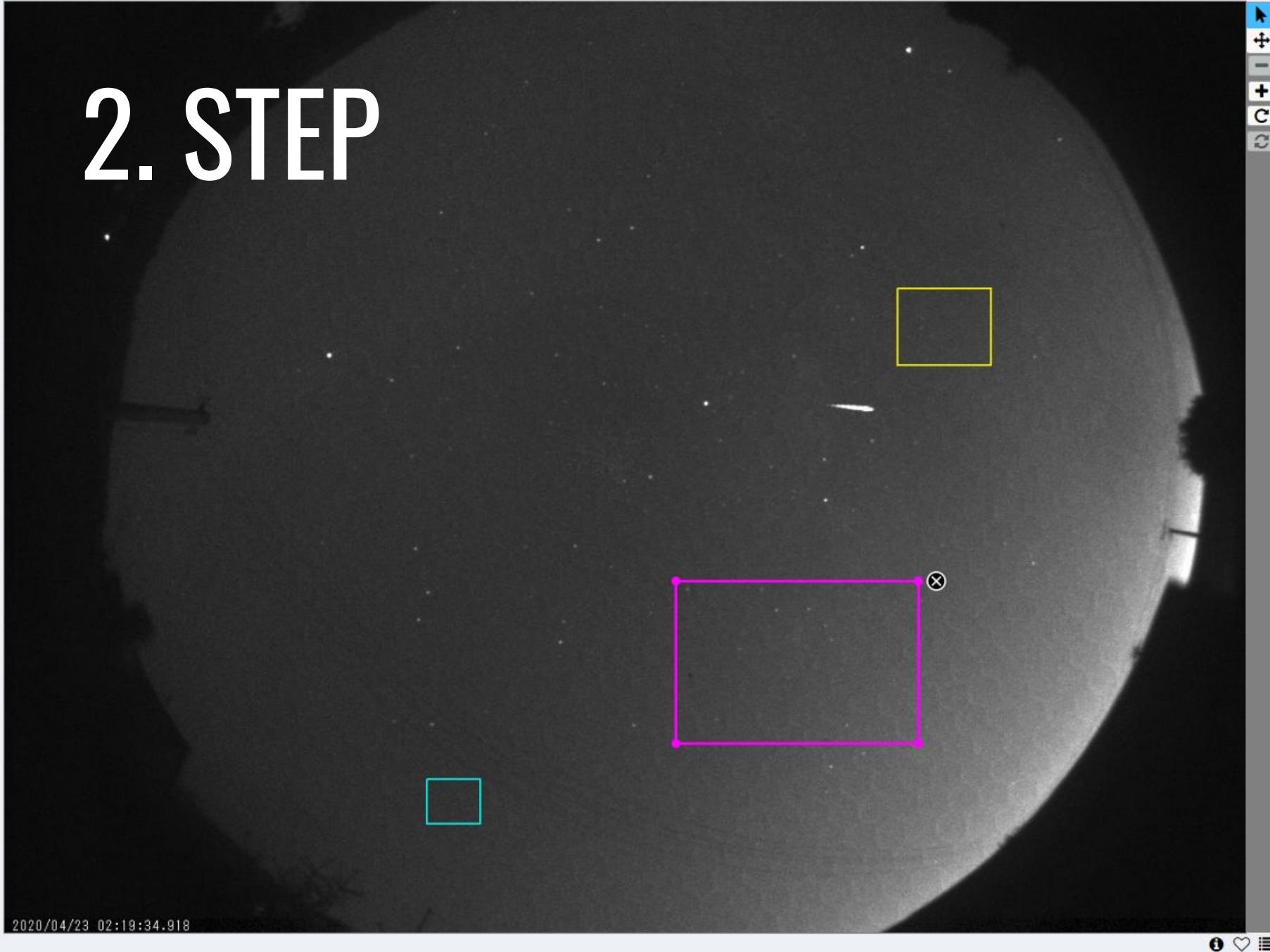
Done

Look
carefully
↓
Zoom in
↓
Find the
event

NOT SURE WHAT YOU SEE?



2. STEP



TASK

TUTORIAL

Označ ho

Mrkva (Carrot sprite)

1 drawn

Stíp (Column sprite)

1 drawn

Fontána (Jet, Starter)

1 drawn

Back

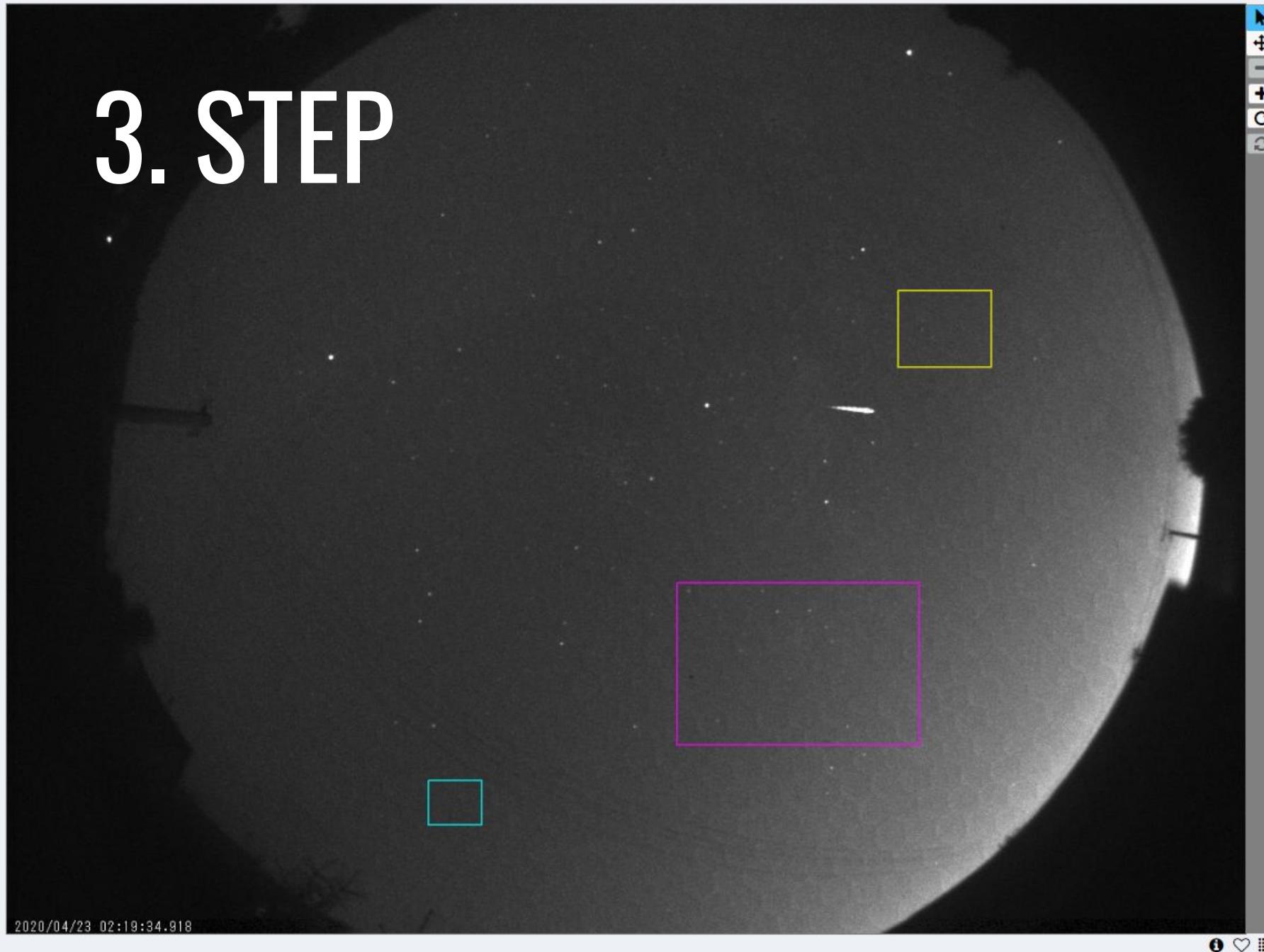
Next →

Select type



Annotate
the event

3. STEP



TASK

TUTORIAL

Označil si všetko?

Áno

Nie

Back

Done

Everything?

No

Yes

2.
step

Done



BUILD A PROJECT

1. Sign in /
Register

Edit View

2. Click →

Create a new project

How-to

Glossary

Policies

Best Practices

Project Builder Talk

4. Write a short
description of your
project

PROJECT NAME

SHORT DESCRIPTION

INTRODUCTION

Metódy hlbokeho učenia sa stávajú najúčinnejšími prístupmi v oblasti počítačového videnia. Jedna zo základných úloh kde sú tieto algoritmy veľmi efektívne je detekcia nepravidelných a sporadických štruktúr. Práve preto sú veľmi vhodné pre vesmírny výskum, kedy je vo veľkom množstve dát potrebné detegovať špecifické udalosti.

Cancel Create project

3. Choose a
project name

5. Write a longer
introduction about
what your project is
about

6. Create project

ZOONIVERSE

Projects
Collections
Build a Project
How to Build
Project Policies
FAQ

About Us
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Our Team
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Contact Us

Zooniverse Talk
Daily Zooniverse
Blog

f t

petra.kamenske

PROJECT DETAILS

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Project details

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[Tutorial](#)

Media

Visibility

7. Choose and upload a logo

[Talk](#)

[Data Exports](#)

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NEED SOME HELP?

[Read a tutorial](#)

[Ask for help on talk](#)

[Glossary](#)

OTHER ACTIONS

[Delete this project](#)

Input the basic information about your project, and set up its home page.

Avatar



Pick a logo to represent your project. To add an image, either drag and drop or click to open your file viewer. For best results, use a square image of not more than 50 KB.

Background image



This image will be the background for all of your project pages, including your project's front page. To add an image, either drag and drop or left click to open your file viewer. For best results, use good quality images no more than 256 KB.

Volunteers can choose which workflow they work on

NAME

SPACE::LAB summer school 2022 - Detection TLE

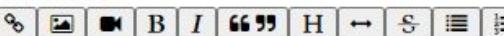
The project name is the first thing people will see about the project, and it will show up in the project URL. Try to keep it short and sweet. Your project's URL is [/projects/petra-dot-kamenska/space-lab-summer-school-2022-detection-tle](#)

DESCRIPTION

Automatická detekcia TLE na snímkach AMOS pomocou hlbokého učenia

This should be a one-line call to action for your project that displays on your landing page. Some volunteers will decide whether to try your project based on reading this, so try to write short text that will make people actively want to join your project. 235 of 300 characters remaining.

INTRODUCTION



Metódy hlbokého učenia sa stávajú najúčinnejšími prístupmi v oblasti počítačového videnia. Jedna zo základných úloh kde sú tieto algoritmy veľmi efektívne je detekcia nepravidelných a sporadických štruktúr. Práve preto sú velmi vhodné pre vesmírny výskum, kedy je vo veľkom množstve dát potrebné detegovať špecifické udalosti. Takými sú nadoblačné blesky (Transient Luminous Events), ktoré je možné pozorovať pomocou celooblohoučových kamier AMOS.

Add a brief introduction to get people interested in your project. This will display on your landing page. 1056 of 1500 characters remaining.

WORKFLOW DESCRIPTION

Add text here when you have multiple workflows and want to help your volunteers decide which one they should do. 500 of 500 characters remaining.

RESEARCHER QUOTE

Choose a Researcher

8. Choose and upload a background image

UPLOAD DATASET

Test_Dataset #107087

A subject is a unit of data to be analyzed. A subject can include one or more images that will be analyzed at the same time by volunteers. A subject set consists of a list of subjects (the "manifest") defining their properties, and the images themselves.

Feel free to group subjects into sets in the way that is most useful for your research. Many projects will find it's best to just have all their subjects in 1 set, but not all.

The project has 0 uploaded subjects. You have uploaded 0 subjects from an allowance of 10000. Your uploaded subject count is the tally of all subjects (including those deleted) that your account has uploaded through the project builder or Zooniverse API. Please [contact us](#) to request changes to your allowance.

We strongly recommend uploading subjects in batches of 500 - 1,000 at a time. When uploading large numbers of subjects, we recommend using our [Panoptes command line interface](#) or our [Panoptes Client package for Python](#) rather than the web portal.

NAME

Test_Dataset

A subject set's name is only seen by the research team.

This set contains subjects:

Page of ?

**10. Choose a name
for your dataset**

Drag-and-drop or click to upload manifests and subject images here (you must select the media files as well as the manifest)

Manifests must be .csv or .tsv. The first row should define metadata headers. All other rows should include at least one reference to an image filename in the same directory as the manifest.

Headers that begin with "#" or "//" denote private fields that will not be visible to classifiers in the main classification interface or in the Talk discussion tool.

Headers that begin with "!" denote fields that will not be visible to classifiers in the main classification interface but will be visible after classification in the Talk discussion tool.

Subject images can be up to 1000KB and any of: .jpg, .jpeg, .png, .gif, .svg, .mp3, .m4a, .mpeg, .txt, .json and may not contain /, \, :, ,

Upload 0 new subjects

**12. Upload
subjects**

**11. Upload
images**

[View project](#)[Project details](#)[About](#)[Collaborators](#)[Field guide](#)[Tutorial](#)[Media](#)[Visibility](#)[Talk](#)[Data Exports](#)[Workflows](#)[Subject Sets](#)

NEED SOME HELP?

[Read a tutorial](#)[Ask for help on talk](#)[Glossary](#)

OTHER ACTIONS

[Delete this project](#)

A workflow is the sequence of tasks that you're asking volunteers to perform.

An asterisk (*) denotes a default workflow.

If you have multiple workflows you can rearrange the order in which they are listed on your project's front page by clicking the reorder view button and then clicking the left gray tab next to each workflow title listed below.

Note: Please leave at least one active workflow; even if all workflows are 100% complete.

[Reorder view](#)

No workflows are currently associated with this project.

[New workflow](#)

14. Create new workflow

STATUS

In a live project active workflows are available to volunteer

If an active workflow is the default workflow for the project

COMPLETENESS STATISTIC

Use this option to change how each workflow's completeness is calculated on the public statistics page.

When using "Classification Count" the completeness will increase after each classification. The total number of classifications needed to complete the workflow is estimated based on the number of subjects assigned to the workflow. If the workflow has a constant retirement limit, it will be removed from the project when it reaches that limit. If the retirement limit is changed and/or subject sets are unlinked from a live workflow, this estimate will be inaccurate. To avoid these issues, subject sets should not be removed, instead completed workflows should be deactivated and new ones created for new subject sets (note: workflows can be copied and pasted at the top of a workflow's edit page).

When using "Retirement Count" the completeness will increase after each image retires (note: this value is re-calculated once an hour). Since the images are shown in a random order, this completeness estimate will be slow to increase until the project is close to being finished. If your project does not have a constant retirement limit or a custom retirement rule, this estimate will be the most accurate.

STATISTICS VISIBILITY

Active workflows are visible on the project's statistics page by default, and inactive projects are hidden by default. If there is a reason to hide an active workflow from the statistics page, such as a workflow being used in an a/b split experiment, or a reason to show an inactive workflow, then toggle the "Show on Stats Page" checkbox.

CREATE A WORKFLOW

13. Click



14. Create new workflow

NEW WORKFLOW TITLE

[Cancel](#)[Add](#)

15. Name your workflow

Workflow titles can be edited if a project is live or in development.

Workflow titles can be removed as the default workflow.

16. Add workflow

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NEED SOME HELP?

Read a tutorial

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OTHER ACTIONS

Delete this project

21. Choose a dataset



Workflow1 #22216

A workflow is the sequence of tasks that you're asking volunteers to perform. For example, you might want to ask volunteers to answer questions about your images, or to mark features in your images, or both.

WORKFLOW TITLE

Workflow1

If you let your volunteers choose which workflow to attempt, this text will appear as an option on the project front page.

TASKS

© Vidíš na obrázku nejaký TLE? (first)

TO

 Add a task

17. Add a task



First task Vidíš na obrázku nejaký TLE? 

A task is a unit of work you are asking volunteers to do. You can ask them to answer a question or mark an image. Add a task by clicking the question or marking buttons below.

Version 4.8 - Status: 

Version indicates which version of the workflow you are on. Every time you save changes to a workflow, you create a new version. Big changes, like adding or deleting questions, will change the version by a whole number: 1.0 to 2.0, etc. Smaller changes, like modifying the help text, will change the version by a decimal, e.g. 2.0 to 2.1. The version is tracked with each classification in case you need it when analyzing your data.

Status indicates whether a workflow is active or inactive. Active workflows are available to volunteers and classifications count toward subject retirement. Workflow status can be managed under the Visibility section within the Project Builder.

ASSOCIATED SUBJECT SETS

Choose the set of subjects you want to use for this workflow.

- Test_Dataset (#107088)

SET ANNOTATION PERSISTENCE

Save the annotation of the task you are on when the back button is clicked.

Persist annotations

MAIN TEXT

Vidíš na obrázku nejaký TLE?

Describe the task, or ask the question, in a way that is clear to a non-expert. You can use markdown to format this text.

HELP TEXT

 TLE:

! [Imgur] (<https://i.imgur.com/UavjF8i.jpg>)
! [Imgur] (<https://i.imgur.com/PB219Lk.jpg>)
! [Imgur] (<https://i.imgur.com/mlhe2u1.jpg>)

Add text and images for a window that pops up when volunteers click "Need some help?" You can use markdown to format this text and add images. The help text can be as long as you need, but you should try to keep it simple and avoid jargon.

CHOICES

Allow hiding marks Allow multiple Required

Áno

Next task [Submit classification and load next subject](#) 

Nie

Next task [Submit classification and load next subject](#) 

The answers will be displayed next to each checkbox, so this text is as important as

18. Write a question



19. Write a help text



20. Add answer options



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NEED SOME HELP?
Read a tutorial
Ask for help on talk
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OTHER ACTIONS
Delete this project

WORKFLOW TITLE
Workflow1

If you let your volunteers choose which workflow to attempt, this text will appear as an option on the project front page.

TASKS

● Vidíš na obrázku nejaký TLE? (first)	T0
Označ ho	T1
● Označil si všetko?	T2

+ Add a task

First task **Vidíš na obrázku nejaký TLE? ▾**

A task is a unit of work you are asking volunteers to do. You can ask them to answer a question or mark an image. Add a task by clicking the question or marking buttons below.

Version 20.21 - Status: **ACTIVE**

Version indicates which version of the workflow you are on. Every time you save changes to a workflow, you create a new version. Big changes, like adding or deleting questions, will change the version by a whole number: 1.0 to 2.0, etc. Smaller changes, like modifying the help text, will change the version by a decimal, e.g. 2.0 to 2.1. The version is tracked with each classification in case you need it when analyzing your data.

Status indicates whether a workflow is active or inactive. Active workflows are available to volunteers and classifications count toward subject retirement. Workflow status can be managed under the Visibility section within the Project Builder.

ASSOCIATED SUBJECT SETS

Choose the set of subjects you want to use for this workflow.

- Test_Dataset (#107088)

SET ANNOTATION PERSISTENCE

Save the annotation of the task you are on when the back button is clicked.

Persist annotations

MAIN TEXT
Označ ho

Describe the task, or ask the question, in a way that is clear to a non-expert. You can use markdown to format this text.

HELP TEXT

23. Add all tasks

Add text and images for a window that pops up when volunteers click "Need some help?" You can use markdown to format this text and add images. The help text can be as long as you need, but you should try to keep it simple and avoid jargon.

CHOICES

Allow hiding marks

Mrkva (Carrot sprite)

Type **rectangle** ▾
Color **Yellow** ▾
Min 0 Max ∞
Sub-tasks (0) Ask users a question about what they've just drawn.

Stíp (Column sprite)

Type **rectangle** ▾
Color **Magenta** ▾
Min 0 Max ∞
Sub-tasks (0) Ask users a question about what they've just drawn.

22. Add choices for annotations

24. Choose a tutorial for project

ASSOCIATED TUTORIAL

Choose the tutorial you want to use for this workflow. Only one can be associated with a workflow at a time.

No Tutorial
 Tutorial #5492 - New Tutorial Title

25. Allow users zoom and pan

PAN AND ZOOM

Pan and zoom allows the user to zoom in and out and pan image subjects in the classification interface.

Pan and Zoom

MULTI-IMAGE OPTIONS

Choose how to display multiple images

Show flipbook ▾
 Allow users to choose flipbook or separate frames
 Clone markers in all frames
Flipbook Play Iterations
An empty iteration value denotes infinite loop.

Allow Users To Flip Image Color

Subject retirement Classification count

How many people should classify each subject before it is "done"? Once a subject has reached the retirement limit it will no longer be shown to any volunteers.

If you'd like more complex retirement rules, please get in touch via the [Contact Us](#) page.

Enable on mobile app

Sorry, but the mobile app will not currently work for this workflow. The following are the requirements for the swipe workflow.

- Question has less than 200 characters ✓
- Cannot provide feedback ✓
- Has one Task ✘
- Has less than three shortcuts ✓
- Task question has no more than one image ✓

Please note that projects that are not launch approved will only show in the preview section of the app.

If you haven't yet, be sure to download the Zooniverse Mobile App on Android or iPhone!

- [Zooniverse for iPhone](#)
- [Zooniverse for Android](#)

Delete this task

26. Select subject retirement

27. Test the workflow



CREATE A TUTORIAL

PROJECT #19295

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NEED SOME HELP?

[Read a tutorial](#)

[Ask for help on talk](#)

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OTHER ACTIONS

[Delete this project](#)

PROJECT TUTORIAL

The project tutorial is a step-by-step introduction to the project's interface.

This is the place to give the volunteers a preview of the data they'll be working with and of the steps they'll be taking to make classifications. It's also a good place to mention any common "gotchas" users might face.

However, it's also important to keep this as short as possible so volunteers can get started classifying as soon as possible!

Tutorials should be linked to a workflow on its workflow editor page to pop up for your project.

You can reorder the steps in your tutorial by clicking and dragging on the left gray tab.

28. Click

TUTORIAL #6154

Tutorial

29. Name your tutorial

Step #1

Step #2



Select media

1. Krok

V prvom kroku uvidíš snímok z celooblochovej kamery AMOS. **Priblíž si obrázok a poriadne si ho prezri!** Vidiš tam nejaké nadoblačné blesky *TLE*? **Hľadaj ich

31. Write instructions

Add a step

30. Add a step

Build a tutorial

32. Build a tutorial

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NEED SOME HELP?

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OTHER ACTIONS

Delete this project

34. Write text about project

In this section:

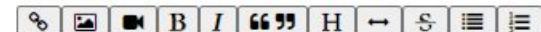
Header 1 will appear orange.

Headers 2 - 6 and hyperlinks will appear dark-blue.

33. Click

This page is for you to describe your research motivations and goals to the volunteers. Feel free to add detail, but try to avoid jargon. This page renders markdown, so you can format it and add images via the Media Library and links.

RESEARCH



```
# Načo je zameraný tento anotačný projekt a čo je vašim cieľom?? #
Vašim cieľom je z obrovského množstva dát - snímok z kamery AMOS vytriediť tie, na ktorých sa nachádzajú nadoblačné blesky TLE, označiť ich a zatriediť do typov. Takto vytriedené dátá budú použité pri následnom učení umelej inteligencie.

Metódy hlbokého učenia sa stávajú najúčinnejšími prístupmi v oblasti počítačového videnia. Jedna zo základných úloh kde sú tieto algoritmy veľmi efektívne je detekcia nepravidelných a sporadických štruktúr. Práve preto sú veľmi vhodné pre vesmírny výskum, kedy je vo veľkom množstve dát potrebné detegovať špecifické udalosti. Takými sú nadoblačné blesky (Transient Luminous Events), ktoré je možné pozorovať pomocou celoobehových kamier AMOS.

![Example Alt Text] (https://vg5b2ejdwb-flywheel.netdna-ssl.com/wp-content/uploads/2021/05/transient-luminous-events-ghost-frankie-lucena.jpg)

## Ako také TLE blesky vyzerajú na snímkach z AMOS kamery? ##

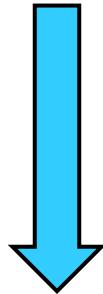
**1. Mrkva ( Carrot sprite )**

![Imgur] (https://i.imgur.com/Adkj3lU.jpg?1)

- vyzerá naozaj ako mrkva s vňatou
- má užší stred, ktorý je na fotkách najjasnejší
```

CREATE AN ABOUT PAGE

NOW IT'S UP TO YOU.
LET'S ANNOTATE



<https://www.zooniverse.org/projects/spacesummerschool2022/space-lab-summer-school-2022-detection-tle>

THE RESULTS

36 484 images

73 people

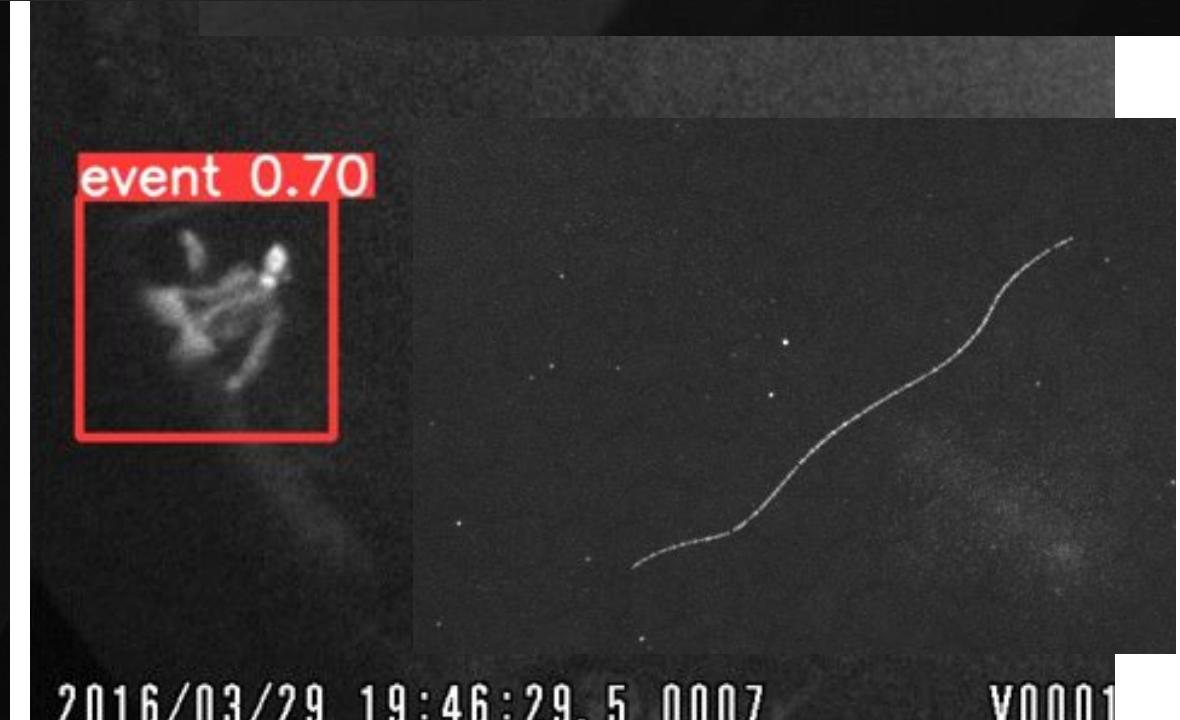
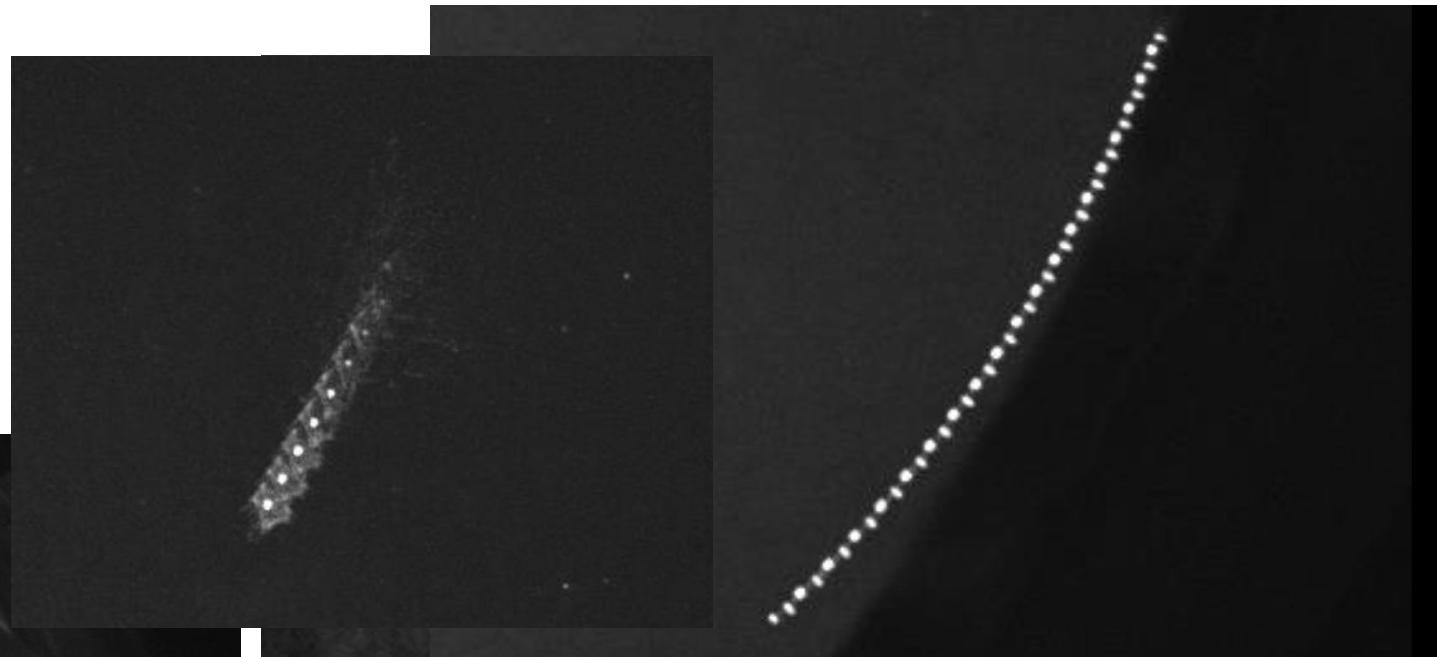
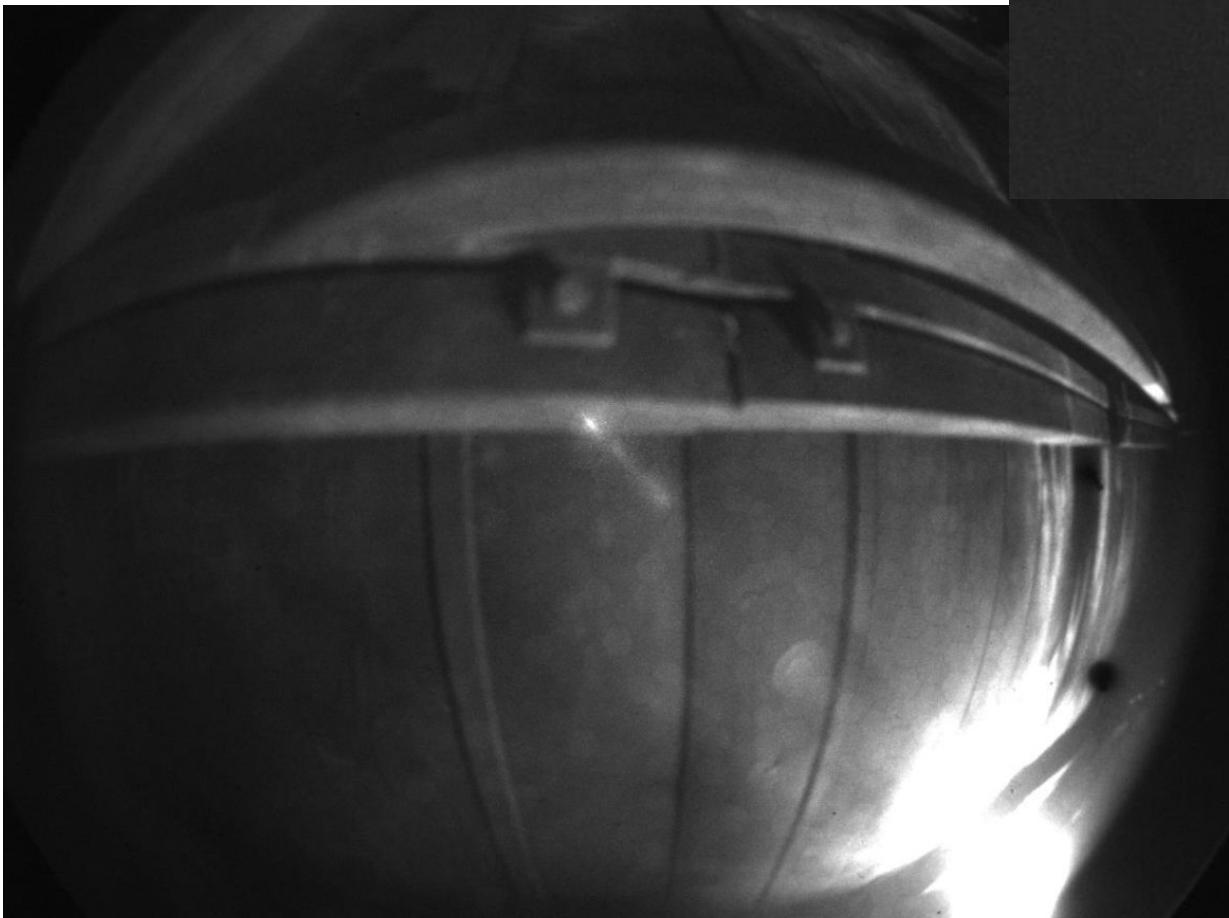
6 hours

290 events

171 true positive events in 142 images

59 % success

INTERESTING FINDS



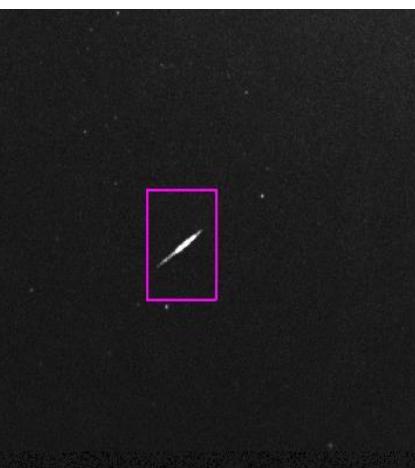
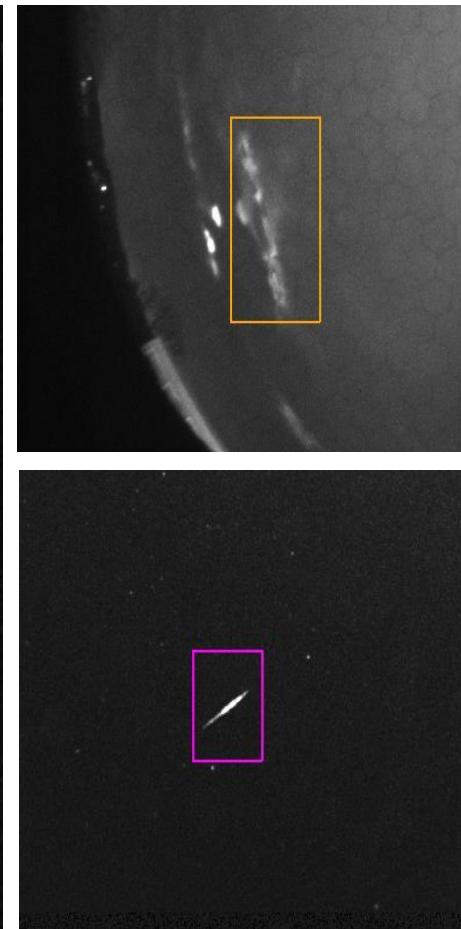
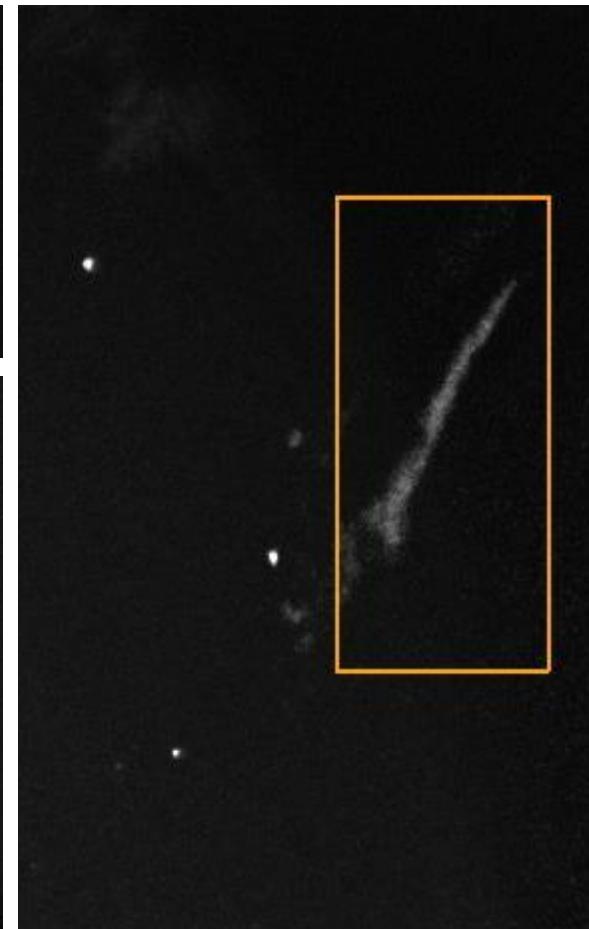
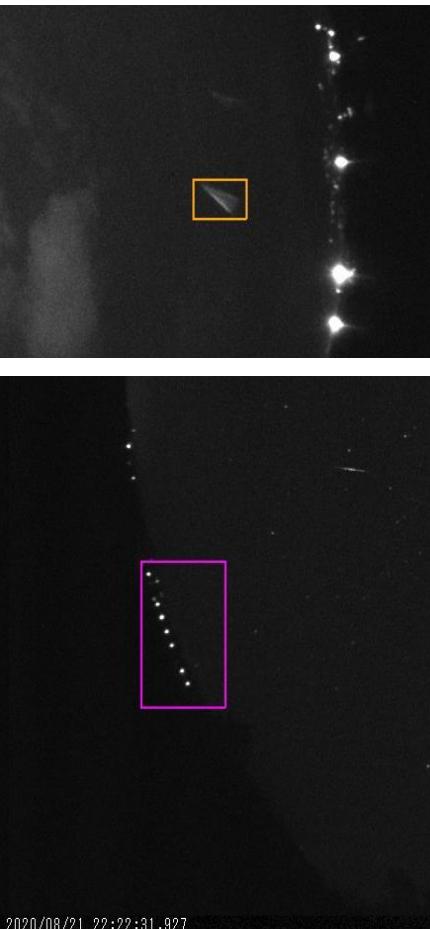
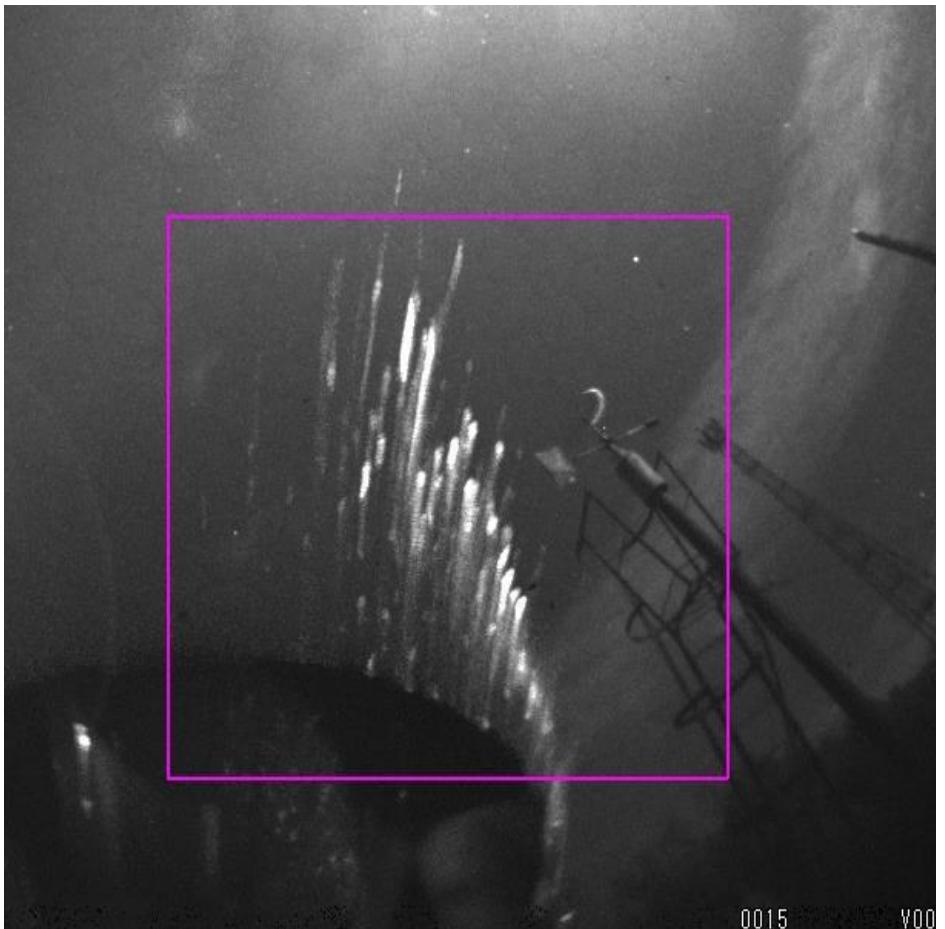
EXTRACTION OF DATA FROM CSV FILE

	is_tle	event	subject_id	x	y	width	height	type
1	Áno	530_222354_ARBO_P.jpg	70026921	360.1607971191406	687.64208984375	177.27883911132812	169.702880859375	Mrkva (Carrot sprite)
2	Áno	s205550_ARBO.jpg	70027115	499.9825439453125	0.21508385241031647	133.079833984375	37.21723960340023	Stíp (Column sprite)
3	Áno	s232322_ARBO.jpg	70027166	241.5023956298828	208.9098663330078	92.40086364746094	109.20106506347656	Mrkva (Carrot sprite)
4	Áno	s231955_ARBO.jpg	70027165	231.01905822753906	128.31336975097656	152.71302795410156	279.0170135498047	Stíp (Column sprite)
5	Áno	003159_AGO.jpg	70028961	992.318115234375	254.92942810058594	45.0386962890625	30.249893188476562	Stíp (Column sprite)
6	Áno	530_205827_ARBO_P.jpg	70026904	402.4268493652344	799.02197265625	113.81173706054688	93.19677734375	Stíp (Column sprite)
7	Áno	170331_AGO-Spec.jpg	70035616	1364.658203125	705.4586181640625	54.074462890625	73.99664306640625	Fontána (Jet, Starter)
8	Áno	s212829_ARBO.jpg	70027145	505.7397155761719	9.855901718139648	107.00692749023438	77.7208194732666	Stíp (Column sprite)
9	Áno	s222928_ARBO.jpg	70027148	191.4687957763672	351.10357666015625	53.073028564453125	78.18795776367188	Stíp (Column sprite)
10	Áno	s013140_ARBO.jpg	70027093	283.8411560058594	121.36839294433594	33.791656494140625	30.412490844726562	Mrkva (Carrot sprite)
11	Áno	s013140_ARBO.jpg	70027093	315.38006591796875	94.33507537841797	23.654144287109375	24.780548095703125	Mrkva (Carrot sprite)
12	Áno	3_213350_ARBO_P_C.jpg	70027071	56.1033821105957	6.553805351257324	27.12337875366211	41.48281192779541	Mrkva (Carrot sprite)
13	Áno	s235513_ARBO.jpg	70027173	1105.64111328125	489.1504211425781	107.5794677734375	106.06423950195312	Mrkva (Carrot sprite)
14	Áno	0_210417_ARBO_P_A.jpg	70026990	87.36114501953125	123.0000228881836	16	23.11107635498047	Stíp (Column sprite)
15	Áno	222045_ARBO.jpg	70058908	200.48838806152344	529.12109375	34.918060302734375	45.0555419921875	Mrkva (Carrot sprite)

DRAWING OF TP ANNOTATIONS



DRAWING OF FP ANNOTATIONS



REQUIREMENTS FOR YOLOV5



Ako vyzerá správny txt súbor?

```
0 0.27787 0.74794 0.03658 0.04188  
1 0.30429 0.77824 0.03252 0.03941  
0 0.26364 0.7238 0.02069 0.01823
```



Ako by vyzeral txt keby sme hodnoty neupravili?

```
0 1003.8726196289062 697.9915771484375 45.33966064453125 41.39715576171875
```



Kroky ako si pripraviť textové súbory:

- Načítať si daný csv súbor
- Vziať len obrázky kde bol nájdený jav is_tle=„Áno“ zo stlpca annotations index 11
- Vytvoriť txt súbor s rovnakým názvom ako obrázok zo stlpca index 12
- Načítať si potrebné údaje zo stlpca annotations 11 (x, y, width, height, type_tle)
- Type_tle premeniť na číslo (mrkva=0, stíp=1, fontána=2)
- Prepočítať hodnoty x, y z ľavého horného rohu na stred obrázku
- Prepočítať všetky hodnoty na interval od 0 po 1
- Jedna anotácia = jeden riadok
- V tvare: 1. typ, 2. x, 3. y, 4. width, 5. height
- Výsledné čísla zaokrúhliť na 5 desatinných miest

POMÔCKA – VZOREC

$$norm_x = \frac{x + \frac{width}{2}}{pictureWidth}$$

$$norm_y = \frac{y + \frac{height}{2}}{pictureHeight}$$

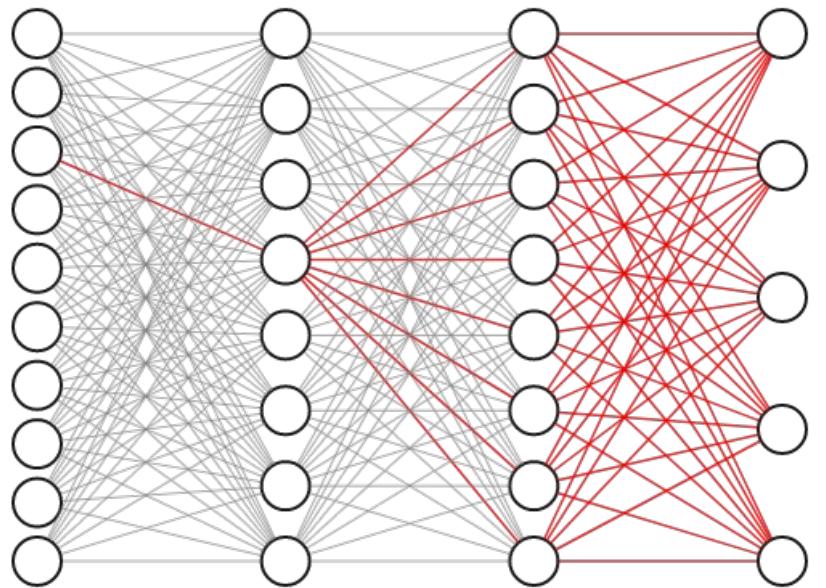
**END OF
PART ONE**

**SEE YOU
AFTER BREAK**



YOLOv5

TRAINING



```
python yolov5/train.py  
--img 640 --rect --batch 60  
--epochs 300  
--data ./yolo/tle8.yaml  
--cfg ./yolov5/models/yolov5s.yaml  
--save-period 10 --workers 0
```

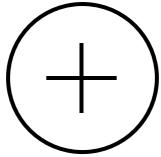
FIRST PROBLEM

Lack of input data
Bad results



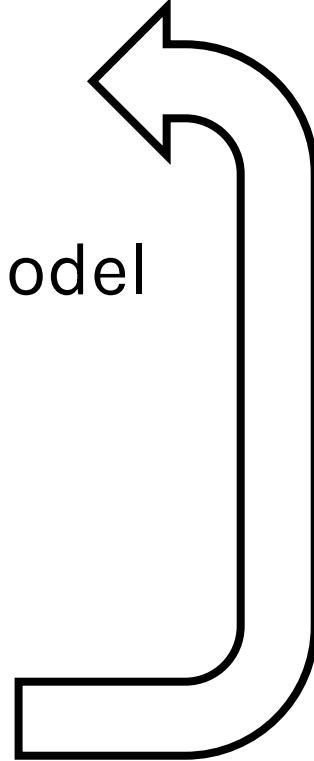
SOLUTION???

ITERATIVE PROCEDURE



CONJUNCTION OF
TYPES

1. More data
2. Other dataset
3. Detect with best model
4. Find TP events
5. Add to train batch
6. Train again
7. Repeat



SECOND PROBLEM

A lot of false positive
cases

Repeating labels
Static objects



SOLUTION???

BLACKENING



Before detection

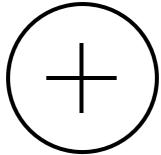
Use values from detection

Recalculation

Blackening static objects on
every location

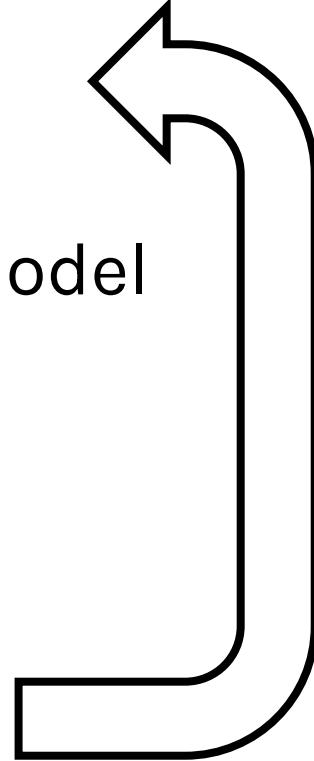
Every camera unique objects

ITERATIVE PROCEDURE

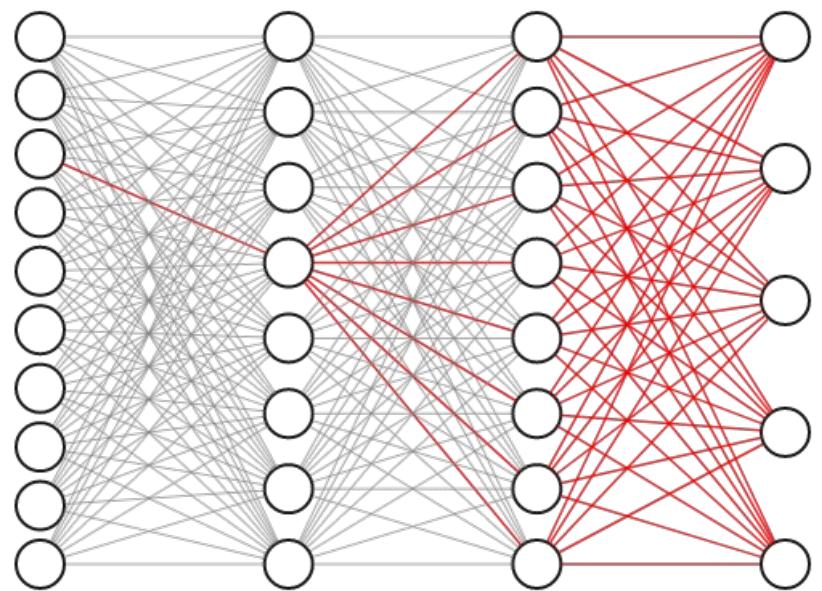


CONJUNCTION OF
TYPES

1. More data
2. Other dataset
3. Detect with best model
4. Find TP events
5. Add to train batch
6. Train again
7. Repeat



FINAL DETECTION



```
!python yolov5/detect.py  
--weights  
./yolov5/runs/train/exp103/weights/  
epoch190.pt  
--source ./yolo/test3  
--iou 0.3 --conf 0.45  
--img 640 --save-txt
```

**END OF
PART TWO**

GOODBEY