WORLD'S LARGEST DYNAMIC SCENES DATASET

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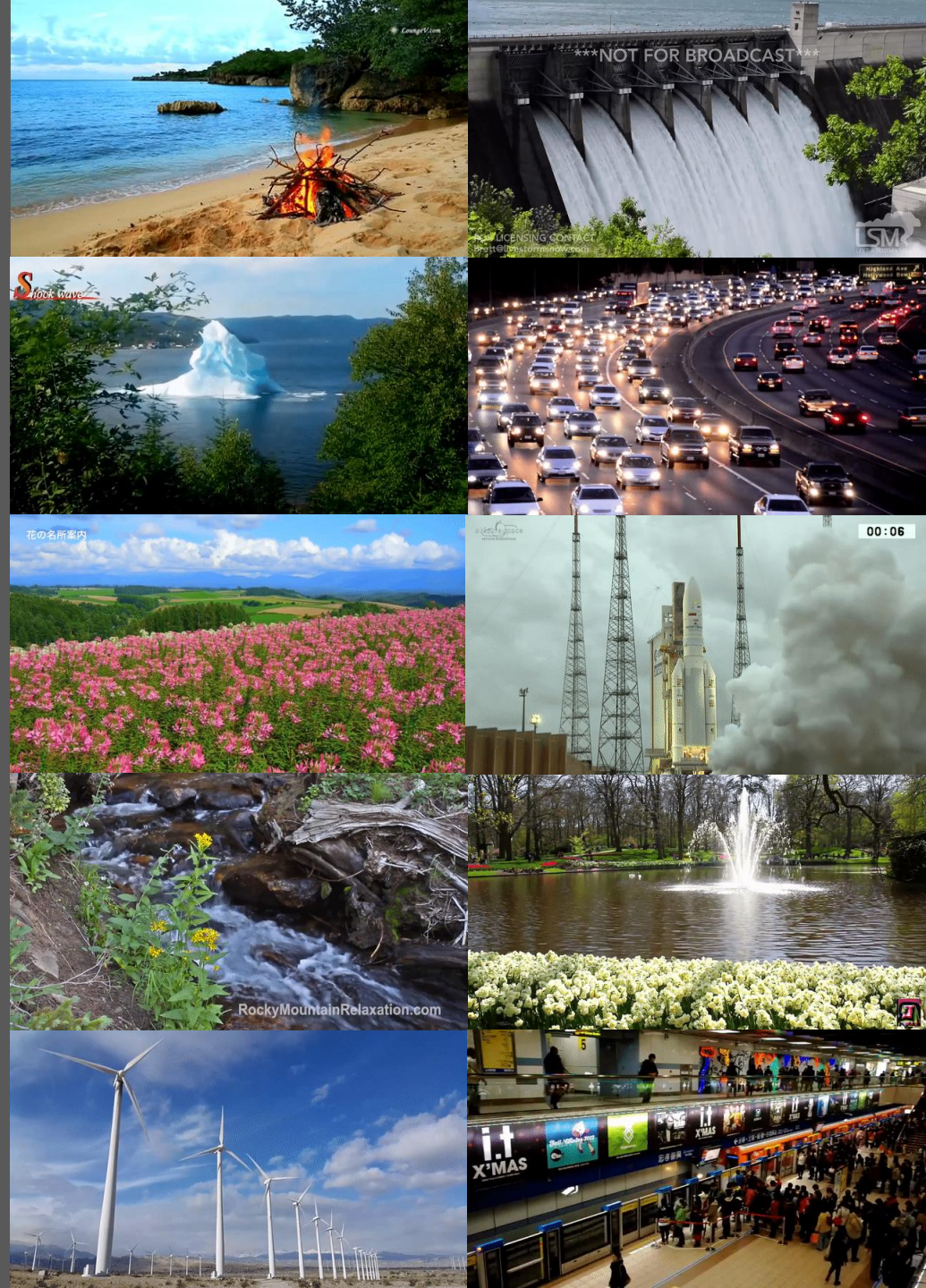
- ✓ Scene Classification is one of the fundamental research challenges in computer vision.
- ✓ Applications for scene understanding
  - Making machines intelligent
  - Smart video search engines
  - Computational photography
- ✓ Previous research in scene understanding mainly focused on static scene analysis.
- ✓ Dynamic scenes provide greater deal of information to understand a scene and is more practical towards real world applications.



WHAT IS A DYNAMIC SCENE ?

Dynamic Textures

Ocean

Windblown
Vegetation

Clouds

Flames

Dynamic Scene
(Beach)

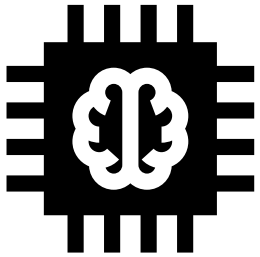
Static Background

Sky

Sand

Rocks

DATASETS OVER ALGORITHMS



Availability of datasets is fundamental to fuel research in areas of computer vision, machine learning & artificial intelligence.

GoogLeNet achieved near-human performance at object classification, training on ImageNet corpus of approximately 1.5 million labeled images using algorithm proposed 2 decades before.

All major technological companies like Microsoft, Facebook, Google are devoting significant resources to develop new datasets highlighting their commercial importance.

To carry forward research in scene understanding, it is critical to have high quality dynamic scene datasets against which training and testing can be done.

SOME DYNAMIC SCENES DATASETS

YUPENN

14 scene categories

Ground truth scene labels

Maryland

10 scene categories

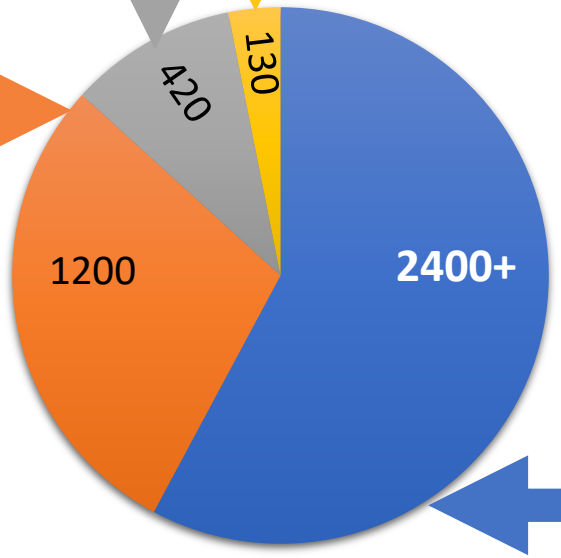
Ground truth scene labels

YUP++

20 scene categories

Subdivision based on camera motion.

Ground truth scene labels



Number of Dynamic Scenes

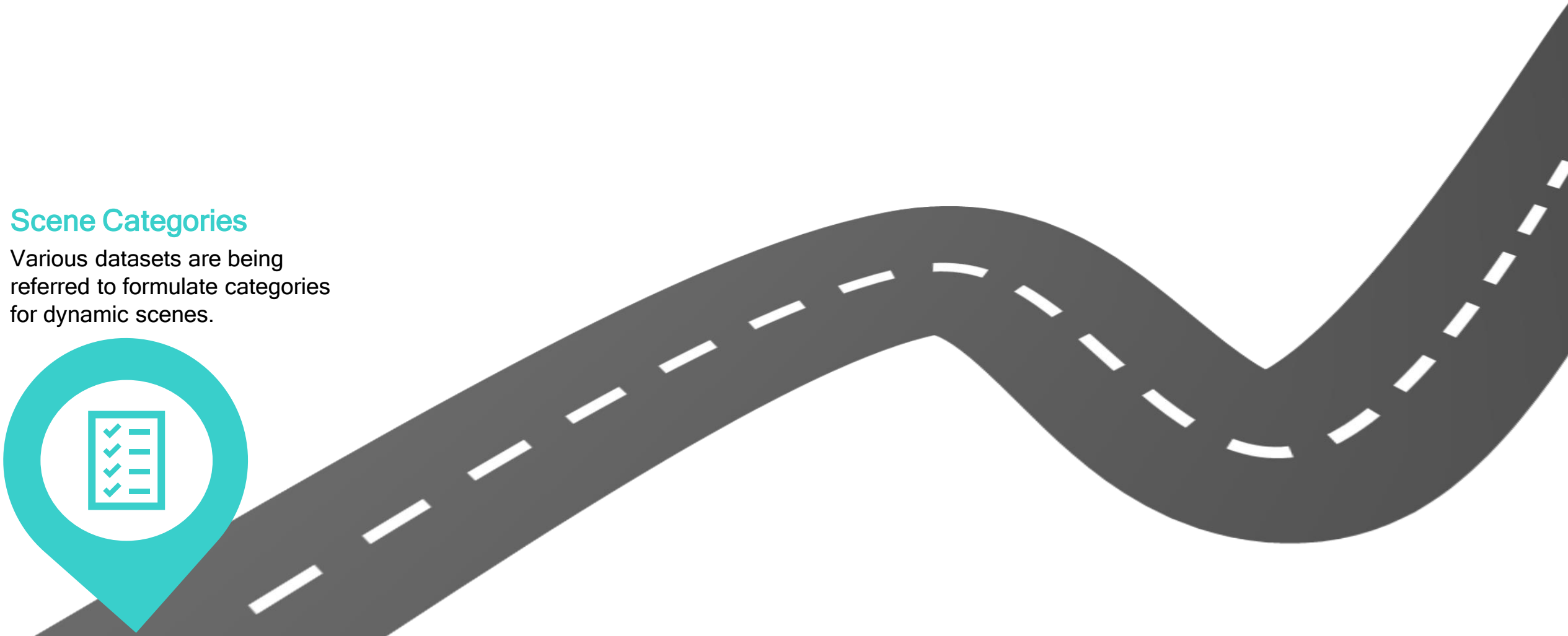
OUR NEW DATASET ★

- ✓ 24 scene categories
- ✓ Subdivision based on camera motion
- ✓ Ground truth scene labels & scene component segmentation with labels
- ✓ Scenes involve atleast two textures

PROJECT ROADMAP

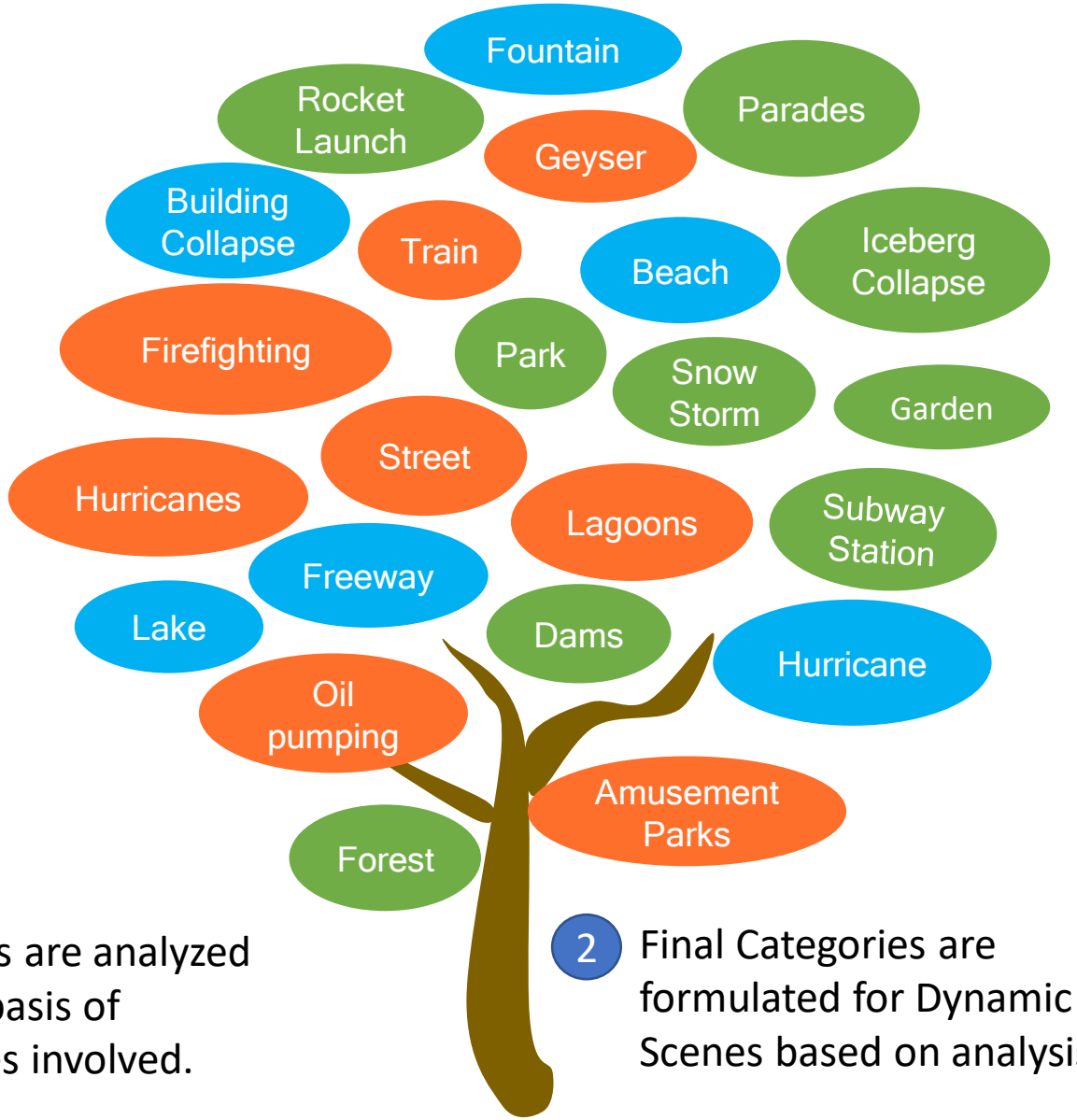
Scene Categories

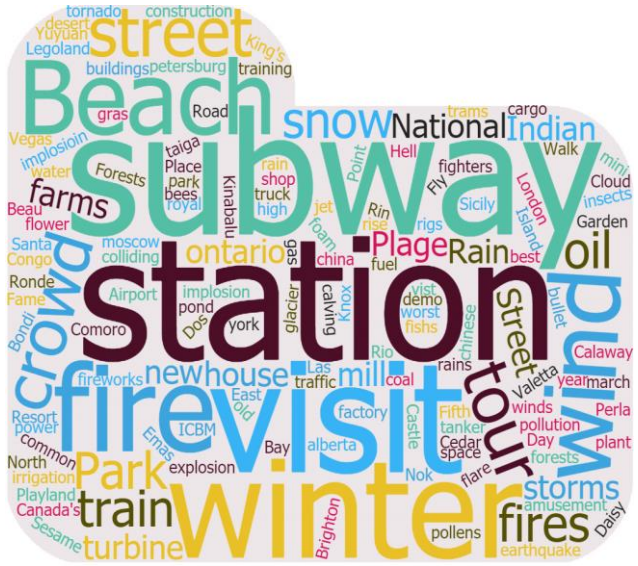
Various datasets are being referred to formulate categories for dynamic scenes.



CATEGORY FORMULATION & KEYWORD SELECTION

SUN database





1 Scene Categories are analyzed and filtered on basis of Dynamic textures involved.

2 Final Categories are formulated for Dynamic Scenes based on analysis.

3 Keywords are chosen for formulated categories to crawl for videos.

PROJECT ROADMAP

Crawling for Videos

Popular video websites like YouTube, Vimeo, Shutterstock, Pond5 are being crawled for videos based on chosen keywords to download videos.

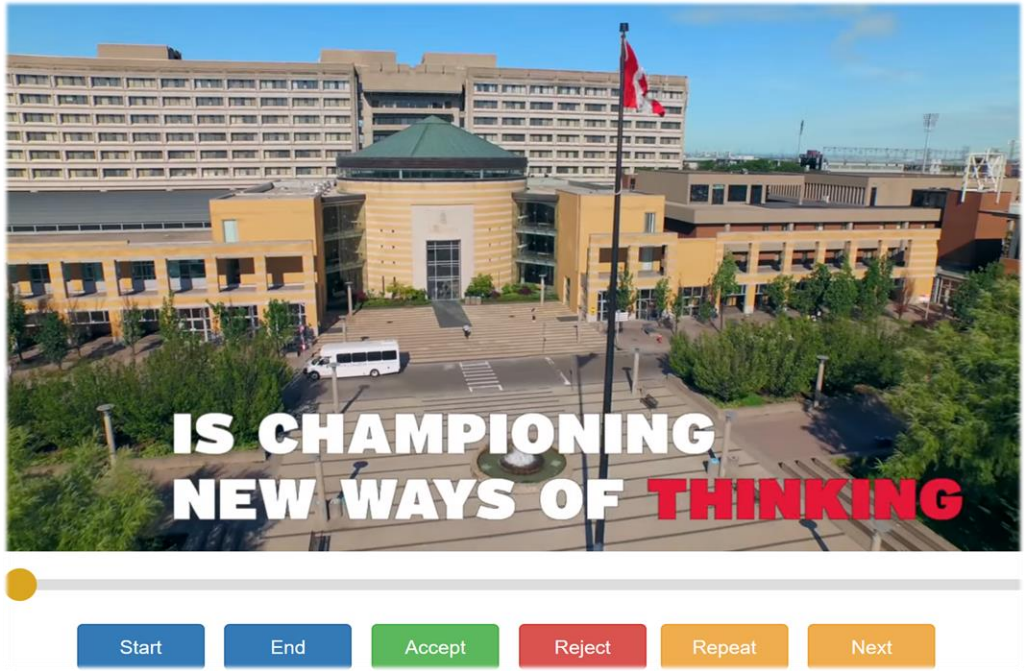
Scene Categories

Various datasets are being referred to formulate categories for dynamic scenes.

CRAWL & DOWNLOAD VIDEOS

YouTube

1. Chosen keywords are uploaded in web based tool.
2. Crawling for videos is done based on keywords to select videos.
3. Selected videos are watched for dynamic scenes and chosen frames are marked to be downloaded later.



pond5
shutterstock
gettyimages

PROJECT ROADMAP

Video Cleanup

Videos are analyzed for dynamic scenes and useful frames are extracted.

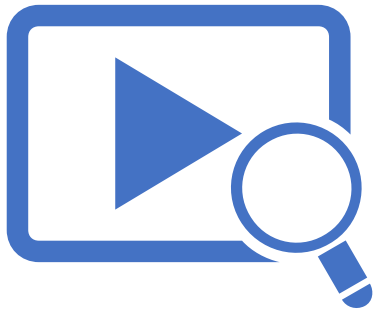
Crawling for Videos

Popular video websites like YouTube, Vimeo, Shutterstock,Pond5 are being crawled for videos based on chosen keywords to download videos.

Scene Categories

Various datasets are being referred to formulate categories for dynamic scenes.

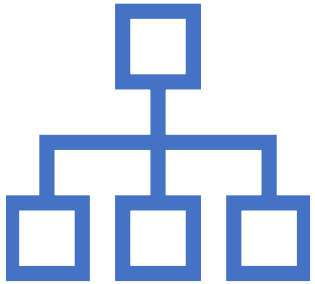
VIDEO CLEANUP & CATEGORIZATION



Collected videos are watched again to filter out videos for

- Poor Video Quality
- Small Time Duration
- Repetition of videos

- ✓ Video categories are analyzed for the number of videos.
- ✓ Categories below threshold are revisited for choice of keywords and video collection process is repeated again.



- ✓ Collected videos are further classified on the basis camera motion.
- ✓ This categorization is useful to algorithms recognizing the scene

PROJECT ROADMAP

Scene Categories

Various datasets are being referred to formulate categories for dynamic scenes.

Crawling for Videos

Popular video websites like YouTube, Vimeo, Shutterstock,Pond5 are being crawled for videos based on chosen keywords to download videos.

Video Cleanup

Videos are analyzed for dynamic scenes and useful frames are extracted.

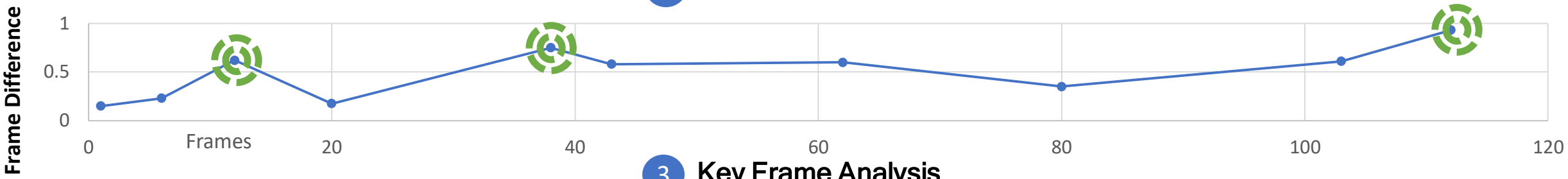
Segmentation & Annotation

Videos are segmented and annotated to generate ground truths.

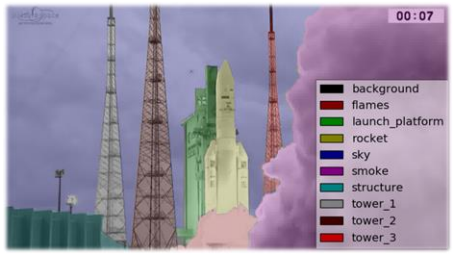
FRAME SEGEMENTATION & ANNOTATION

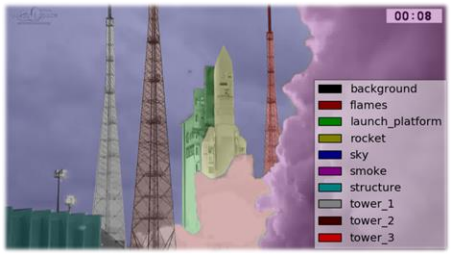
1 Dynamic Scene

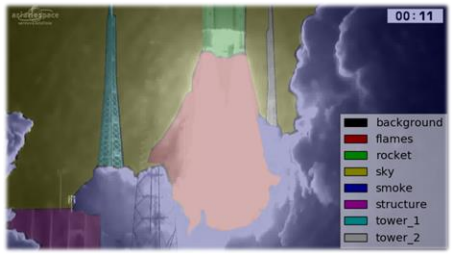
2 Division into frames



3 Key Frame Analysis

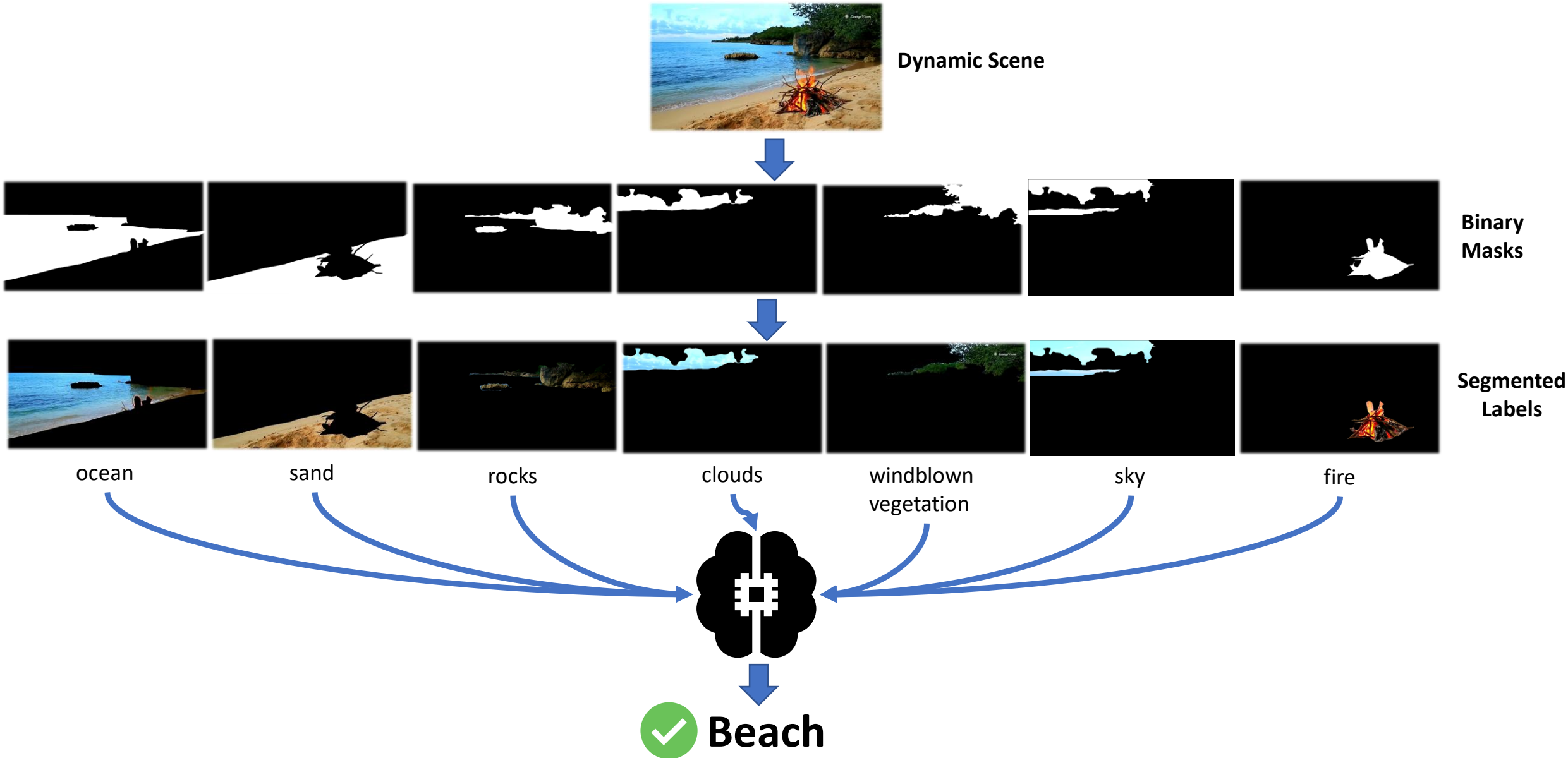






4 Segmentation & Annotation

★ WHY THIS IS IMPORTANT ?



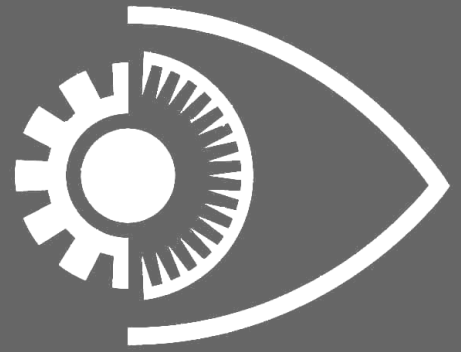
FUTURE RESEARCH

Keyword Formulation & Suggestions

- ✓ Current tool relies solely on selected keywords for video crawling.
- ✓ Video databases can be searched in better way by analyzing keywords in selected videos.

Robust Video Annotation Tool

- ✓ No good Video segmentation and annotation tool for videos.
- ✓ Once developed can play a crucial role in building other computer vision datasets.



Scene Recognition

- ✓ Current dataset can be utilized to develop and test new scene recognition algorithms.

Thank you for listening…

Have any questions?