



THE UNIVERSITY
OF BRITISH COLUMBIA

README: A Literature Survey Assistant

Siddhesh Khandelwal, Shih-Han Chou, Raghav Goyal

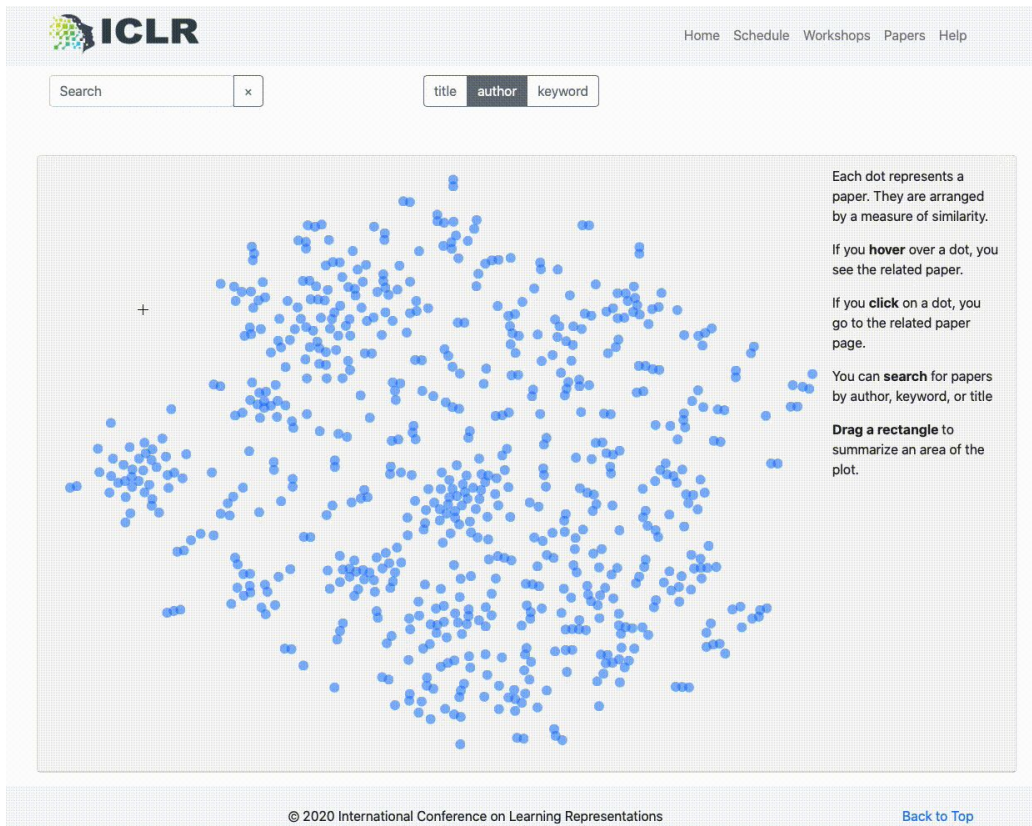
Motivation

- **Exploring** papers in a particular field
 - Often tedious as it requires manual search via keywords

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- **Exploring** papers in a particular field
 - Often tedious as it requires manual search via keywords
- **What** to read next
 - Usually determined by direct references in a particular paper of interest
 - Higher likelihood of missing out on relevant research due to missed citations

Motivation



Motivation



README is an interactive tool designed to address these limitations and make literature surveys easier.

What: Data

- DBLP Citation Network Dataset
 - **4,894,081** papers
 - **45,564,149** citation relationships

Relevant Fields

- ID

124345

- Title

“Best paper out there”

- Authors

[“John Doe”, “Jane Doe”]

- Indexed Abstract

```
{“Length” : 164,  
  “Inverted Index” :  
    {“Our” : [0],  
      “to” : [2, 7, 10, ...]  
    }  
  ...  
}
```

- Paper References

[“480212”, “1231491”, “2148321”, ...]

- Field of Study

[“Data Mining”, “Social Network”, ...]

What: Data

- DBLP Citation Network Dataset
 - **4,894,081** papers
 - **45,564,149** citation relationships
- Derived Data
 - **Conferences:** 28,382 papers from 4 machine learning conferences
 - **Topics:** 30 clusters on paper abstracts
 - **Clustering:** Each paper is assigned to a single cluster based on topic / field of study
 - **Reduction:** Each paper is transformed into 2D coordinates

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Why: Goals

- **Explore:** Look through automatically clustered papers published in different conferences through multiple years

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- **Suggest:** Given a target paper, obtain recommendations for what to read next

Why: Goals

- **Explore:** Look through automatically clustered papers published in different conferences through multiple years
- **Suggest:** Given a target paper, obtain recommendations for what to read next
- **Analyse:** Compare between different ways of clustering and recommending papers to facilitate a deeper understanding of the paper domain

Demo

README



NeurIPS

ACL

EMNLP

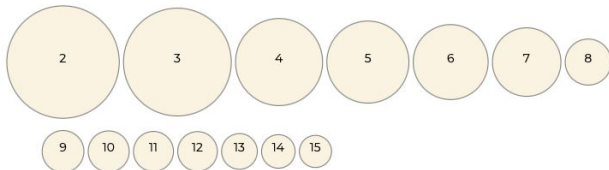
Active learning approach to detecting standing dead trees from ALS point clouds combined with aerial infrared imagery

Przemyslaw Polewski, Wei Yao, Marco Heurich, Peter Krzystek, Uwe Stilla
2015

Due to their role in certain essential forest processes, dead trees are an interesting object of study within the environmental and forest sciences. This paper describes an active learning-based approach to detecting individual standing dead trees, known as snags, from ALS point clouds and aerial color infrared imagery. We first segment individual trees within the 3D point cloud and subsequently ...

CVPR

1



Topic Name

Sort by:

Topic Name

Paper Count

Filter by:

Show FOS

Show Topics

1 Image Segmentation

360 Papers

1 Image Segmentation

360 Papers

2 Scale-Space Segmentation

315 Papers

3 Object Detection

302 Papers

4 Feature Extraction

244 Papers

5 Video Tracking

230 Papers

6 Motion Estimation

210 Papers

7 Convolutional Neural Network

192 Papers

8 Three-Dimensional Face Recognition

129 Papers

9 Contextual Image Classification

117 Papers

10 Feature Detection (Computer Vision)

115 Papers

11 3d Single-Object Recognition

112 Papers

12 Camera Auto-Calibration

111 Papers

13 Feature (Computer Vision)

100 Papers

14 Pose

94 Papers

Title/Author/Year/Conference

Sort by:

Title

Year

FOS

Topic

Filter by:

All

CVPR

EMNLP

ACL

NeurIPS

Current Selection

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FOS: Image Segmentation

Topics: Learning Based, Point Cloud, Commonly Used

A learning-based framework for depth ordering

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Area and length minimizing flows for shape segmentation

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How: Design Choices

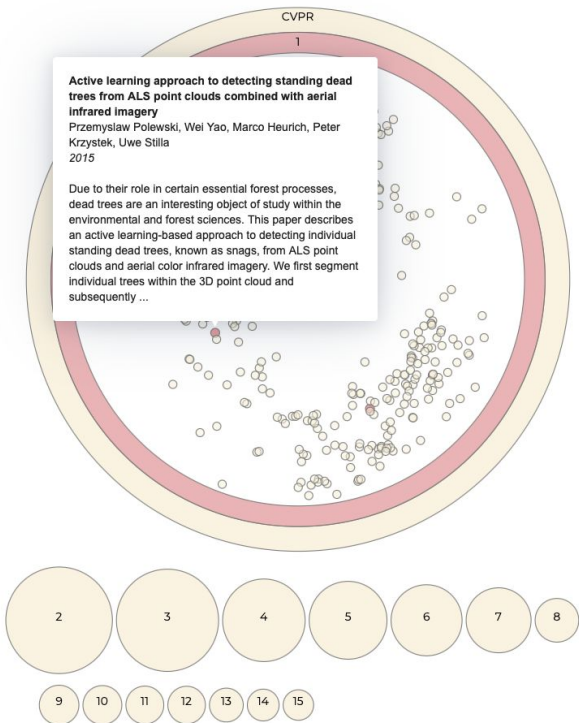
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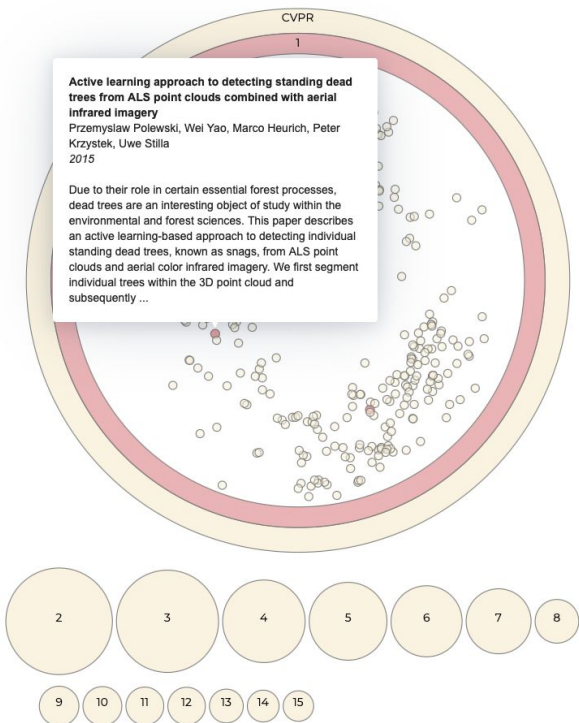
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Topic Name

Sort by: Topic Name Paper Count

Filter by: Show FOS Show Topics

Point Mark

Representation for Conference/Cluster/Paper

Superimpose

Concentric circles to identify the current conference/cluster

Tooltip

Provide additional details on hover

Easy Navigation

Clickable point marks to switch between clusters/conferences

Title/Author/Year/Conference

Sort by: Title Year FOS Topic

Filter by: All CVPR EMNLP ACL NeurIPS Current Selection

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How: Design Choices

Juxtaposed List

List of clusters and papers, allowing for a more readable view

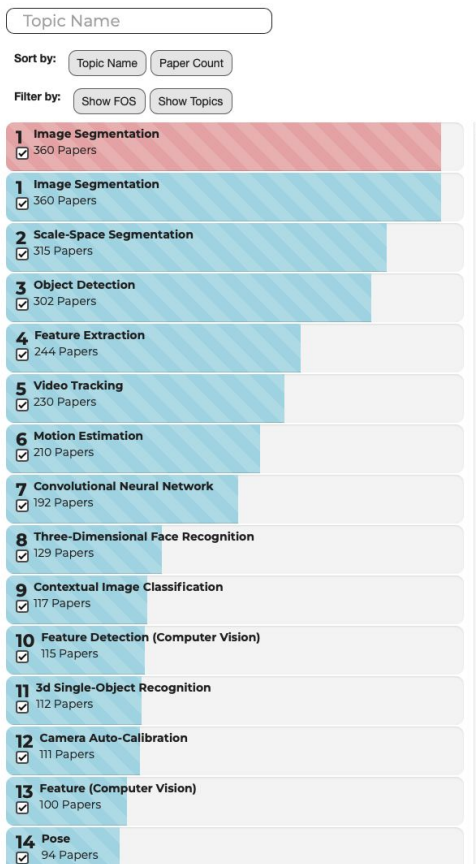
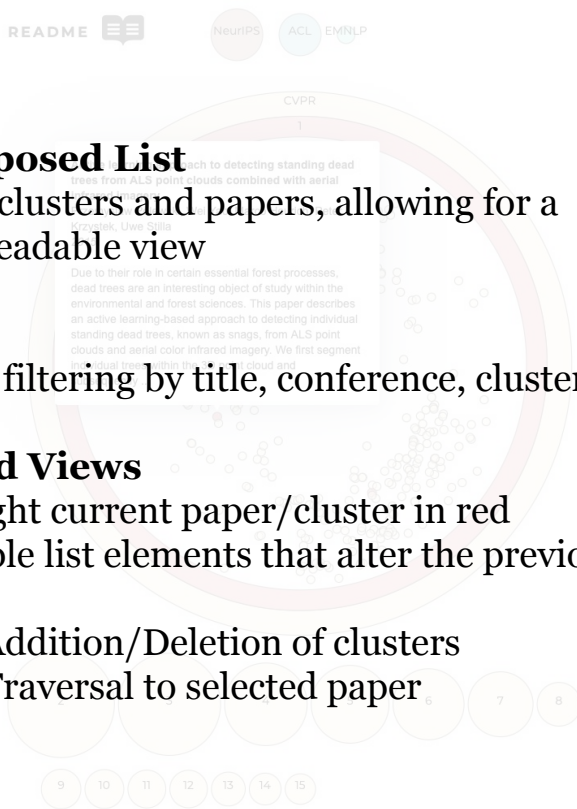
Filter

Allows filtering by title, conference, cluster

Linked Views

Highlight current paper/cluster in red
Clickable list elements that alter the previous view

- Addition/Deletion of clusters
- Traversal to selected paper



How: Design Choices

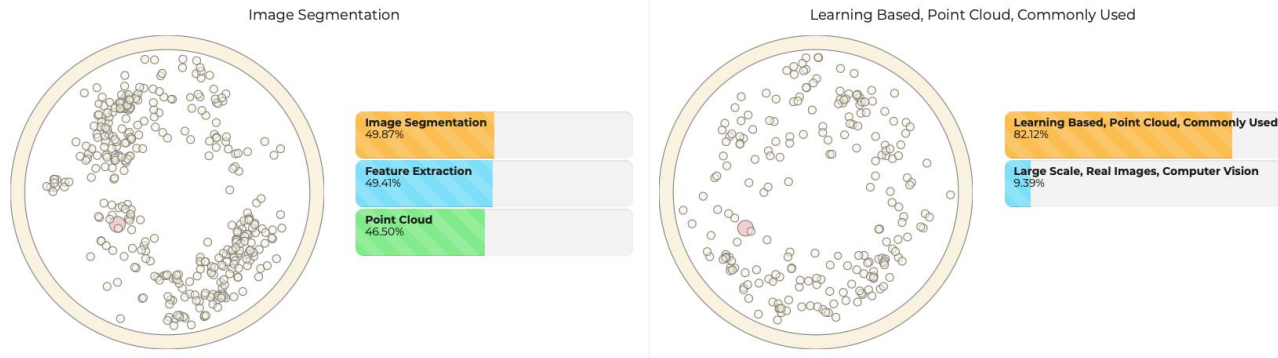
Juxtaposed View

Enabling easy comparison between different cluster assignment and recommendation heuristics

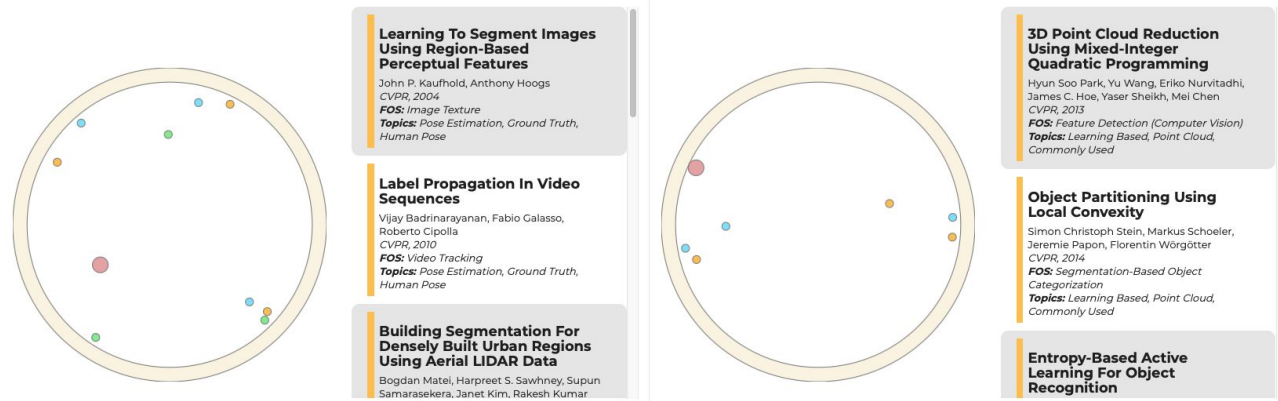
Interaction

Clickable point marks and list elements to move between papers

Exploration Within Assigned FOS/Topic



Paper Recommendations



Limitations

- **Algorithmic Limitations**

- Recommendation relies on similarity heuristics, which might miss certain relevant papers
- Only papers within the same conference are recommended
- t-SNE might imply incorrect relationships

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- **Design Limitations**

- Does not scale well in situations where there are millions of papers and limited number of clusters

Future Work

- Facilitate trend analysis
 - Growth of a field over time
 - Influence a particular paper has on the field

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- **Better recommendation heuristics**
 - Incorporate citation count
 - Give user control over algorithm weights

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- **Better recommendation heuristics**
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- **Making it deployable**
 - Database integration that can be queried on the fly
 - Making it responsive to suit different browser resolutions

Thanks!
Q&A?