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AMSTERDAM

# Effective recommendation in a knowledge base

The SKYbrary case study

# Introduction

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## DNV-GL

- International classification company
- Sectors: aviation, maritime, energy, and oil & gas
- Software and knowledge management solutions

# Problem description

## SKYbrary

- Aviation safety knowledge base
- Content written by small team of experts
- Around 5000 articles



The screenshot shows the SKYbrary website interface. At the top, the logo 'SKYbrary' is displayed with the tagline 'The single point reference for aviation safety knowledge'. A search bar is visible. Below the header, there is a navigation menu on the left with categories like 'Home page', 'Operational issues', 'Human performance', etc. The main content area features a grid of topic tiles under the heading 'Operational Issues', 'Human Performance', 'Enhancing Safety', and 'Safety Regulations'. A 'Highlighted Article' section is also present, featuring an article titled 'Respect severe convective weather – especially near the ground...'. The bottom of the page includes social media sharing icons and a '2015 Safety Forum Automation and Safety' section.




# Problem description

## SKYbrary

- Recommender system for easier navigation
- ‘Recommended articles’ in Article Information-box
- Relatively small amount of data

### Collision Avoidance

Categories: [Loss of Separation](#) | [Operational Issues](#)

Contents [hide]	Article Information
<ul style="list-style-type: none"> <li>1 Description</li> <li>2 Regulation                             <ul style="list-style-type: none"> <li>2.1 Visual Avoidance</li> <li>2.2 ACAS</li> </ul> </li> <li>3 Related Articles</li> <li>4 Further Reading</li> </ul>	<p>Category: Loss of Separation </p> <p>Content source: SKYbrary </p> <p>Content control: EUROCONTROL </p>

#### Description

It is a fundamental principle of flight that those involved in the management of a flight, especially pilots and air traffic controllers, shall take all necessary action to avoid collision.

Collision avoidance is achieved when the pilot(s) become(s) aware of conflicting traffic by one of the following means:

- Visual observation:
  - The pilot takes visual avoiding action (application of the "See and Avoid" principle); or,
- Airborne Collision Avoidance System (ACAS) alert:
  - The pilot takes the avoiding action indicated on ACAS equipment; or,

# Research questions

## Main question

- What is an effective algorithm or combination of algorithms for a relatively small digital knowledge base containing highly specialized information?

## Sub questions

- Which type of algorithm works best for a recommender system for such a knowledge base according to the content editors of SKYbrary?
- How do the recommendations made by algorithms differ from the manually selected 'Related Links'-section of each article?

# Research methodology

## Three algorithms:

- User-navigation based
- Content-based
- Hybrid

## Evaluation:

- Skybrary experts
- Related links

## Data:

- Google Analytics statistics
- Content and metadata



# Results

- An evaluation of recommender system algorithms
  - Which one works best for knowledge bases like SKYbrary?
- Advice for DNV-GL
- Demo application



# Thank you for listening!

Any questions?