THE UNIVERSITY OF
MELBOURNE

COMP90044
Research Methods, Semester 2 2019

Research and Library Resources

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Library help during your studies

Library Subject Guide

https://unimelb.libguides.com/COMP90044

Library Consultation

library.unimelb.edu.au/research/research-consultations

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- Science & Engineering collection
- Louise Hanson-Dyer Music Library
- East Asian Collection
- Bookable PCs & project rooms
- After hours study zone

Your assignment

- Activity 1: optional early submission of indicative literature review. This will receive written feedback only, not a mark

  By the time this assignment is released, you will have chosen your research topic. Whether you chose your own topic or one that was suggested, you should already have 2-3 references. For this activity you should select a further 4 or so references that represent the field you are investigating. You should further write a 300-500 word introduction for your literature review, describing the nature of the problem, and an outline of the structure of the rest of your review.

  You will receive feedback on:

- Writing (comprehensibility, spelling, grammar)
- Choice of references
- Use of references within the introduction (these should be used to support your problem description)
- The proposed structure of your report

Activity 2

Write a final literature review of not less than 1900 words and not more than 2100 words, not including the bibliography. The review should include 8-10 recent, peer-reviewed references on your chosen topic, in addition to 3-5 foundational publications on which the work in the area is built.

Your literature review should present a clear problem statement, and discuss the contributions of each of your references to the area of research. This analysis should focus on the relevance of each reference to the problem you are discussing, rather than focusing on the outcomes as described by the original authors. Publications should be compared to and contrasted with each other where appropriate, and their strengths and shortcomings should be identified.

Your report should be presented in a professional style, appropriate for a journal or a conference, and be easily read by someone non-expert in your field. The references should be in a standard bibliography format. All submissions must adhere to the University of Melbourne academic integrity policy https://academicintegrity.unimelb.edu.au/.
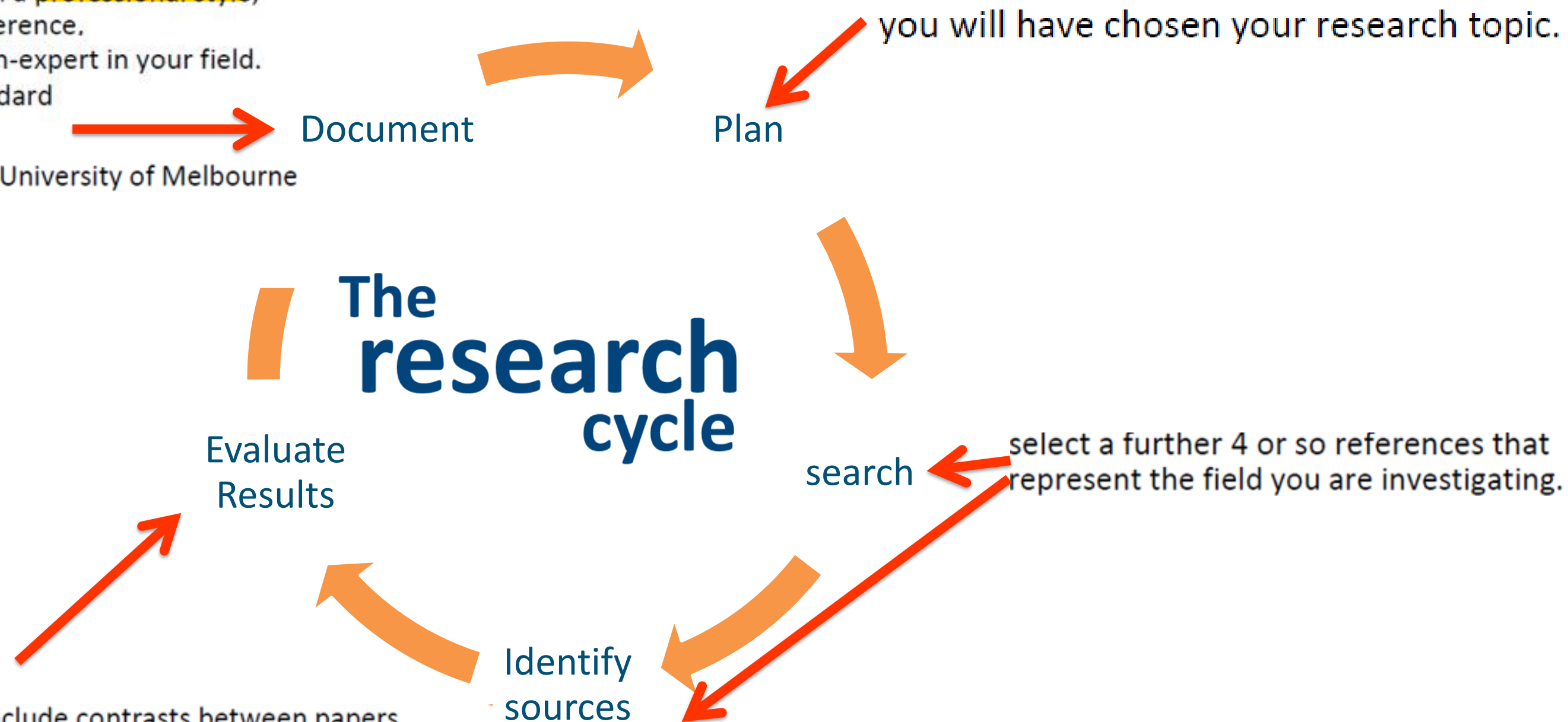
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All submissions must adhere to the University of Melbourne academic integrity policy

No plagiarism

you will have chosen your research topic.

The research cycle

Document

Plan

search

select a further 4 or so references that represent the field you are investigating.

Evaluate Results

Identify sources

Key elements of a strong report include contrasts between papers, comparison of the work to the state of knowledge in the field as a whole, clearly argued criticisms, and clear writing.

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Plan

A key task in robotics is enhancing robot vision in challenging operational conditions. In particular, it is easy for humans to distinguish shadows, but it is more challenging for robots. A number of computer vision approaches have been proposed to deal with object recognition and classification in the presence of heavy shadow.
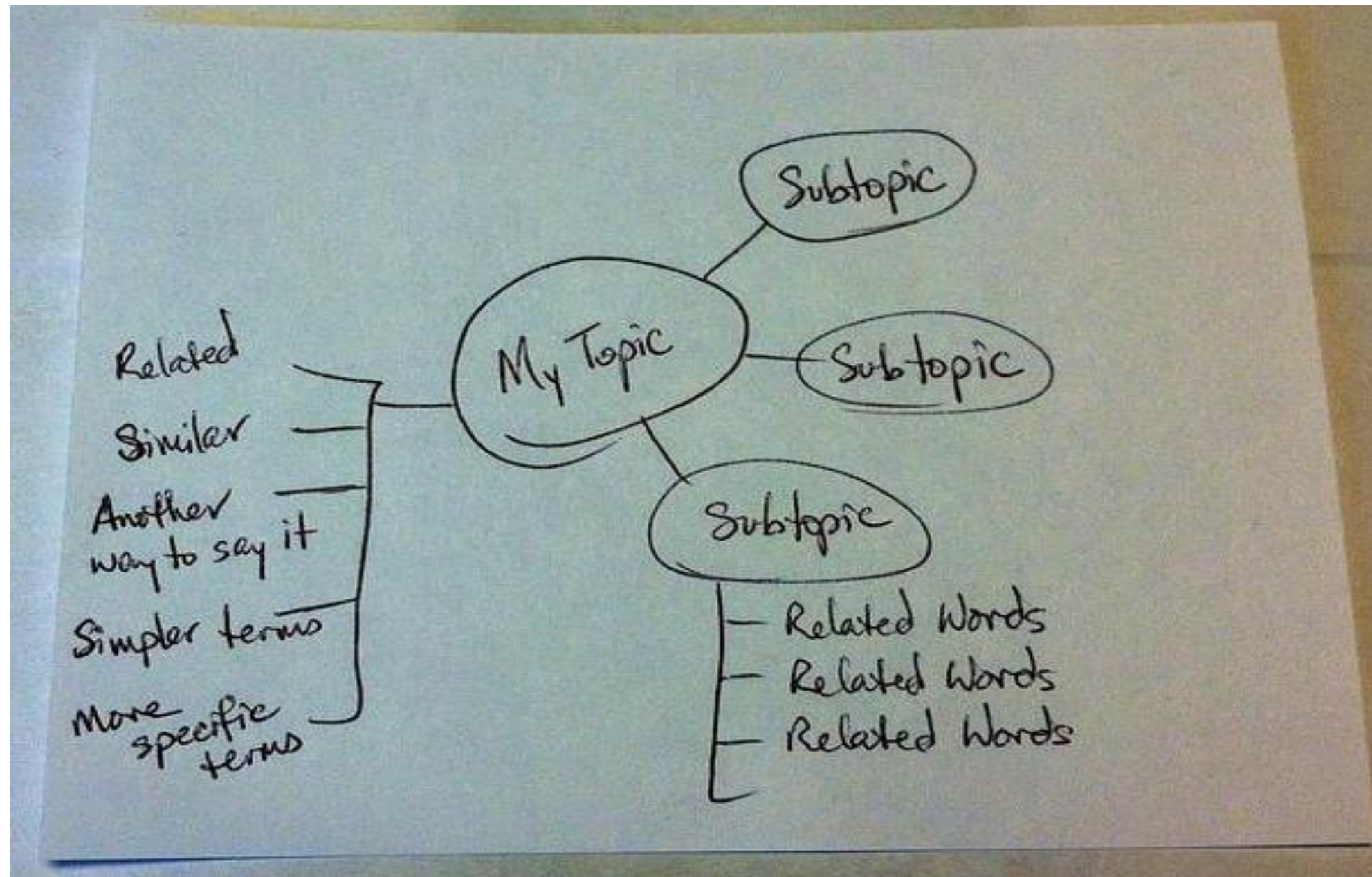
This research project will survey the state of the art in this area.

Search

Brainstorm Keywords

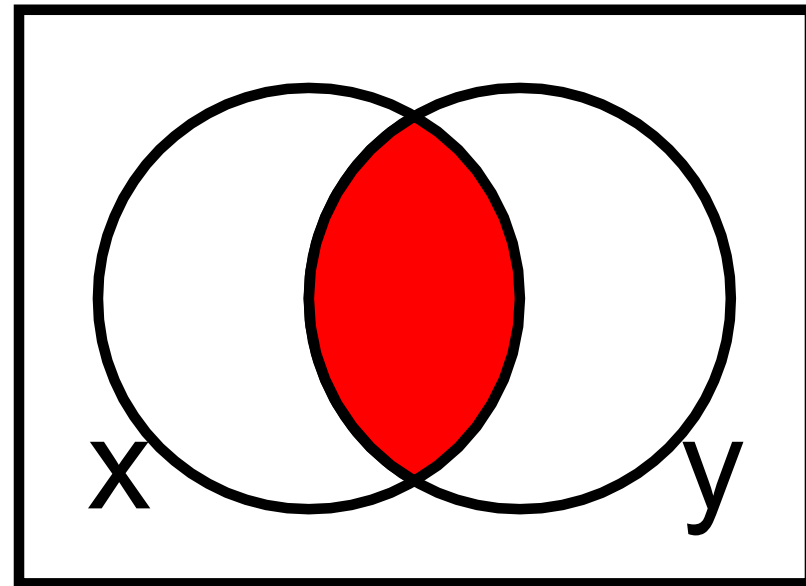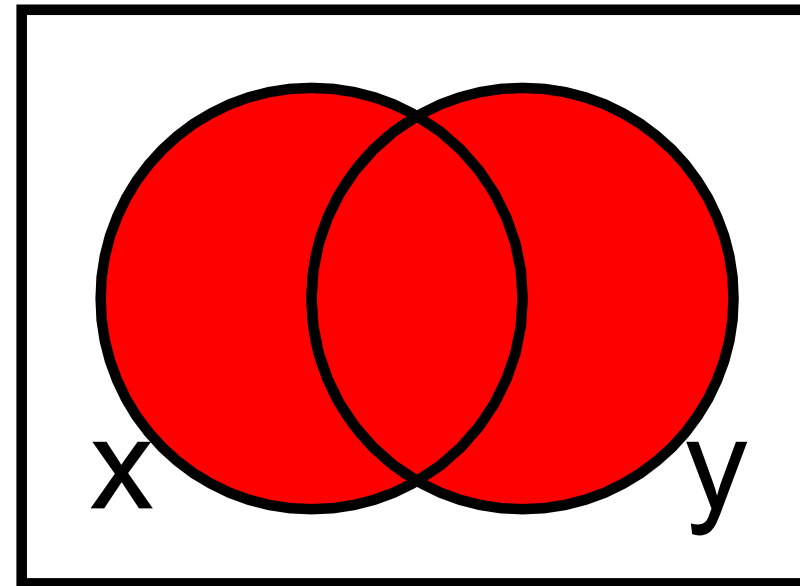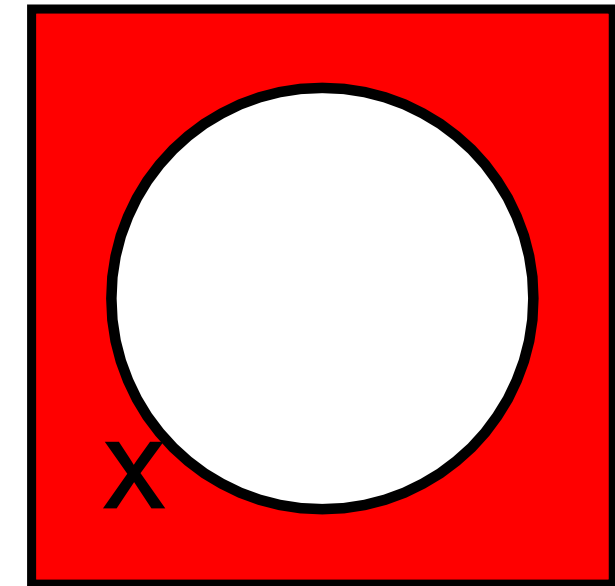| Robotics	Vision	Object recognition
Robots	Perception	Feature extraction
Artificial intelligence	View	Image segmentation
Knowledge Engineering	Optics	Vision algorithms
Machine Learning		

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Boolean logic

AND

$x \wedge y$

OR

$x \vee y$

NOT

$\neg x$

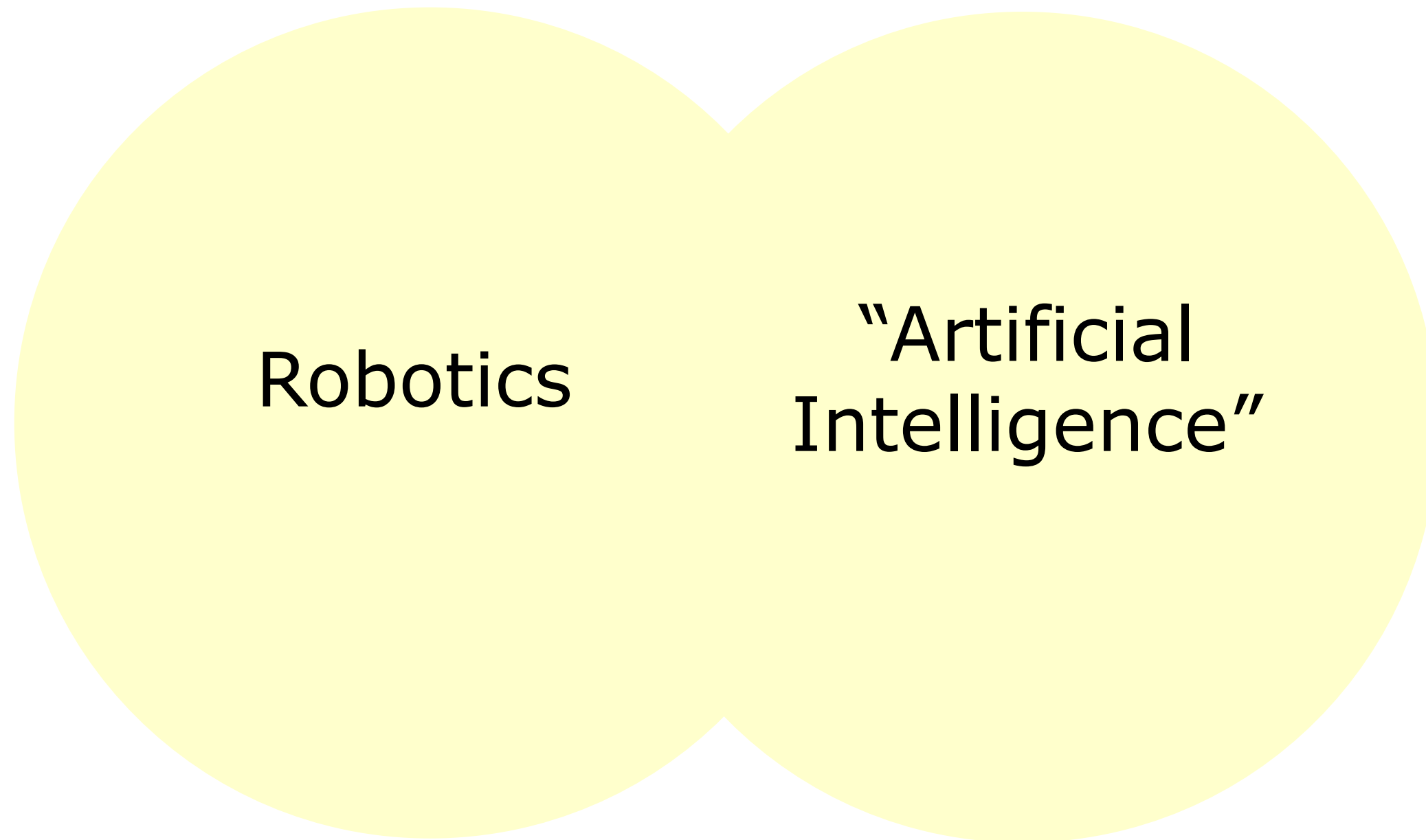THE EVOLUTION STARTS HERE

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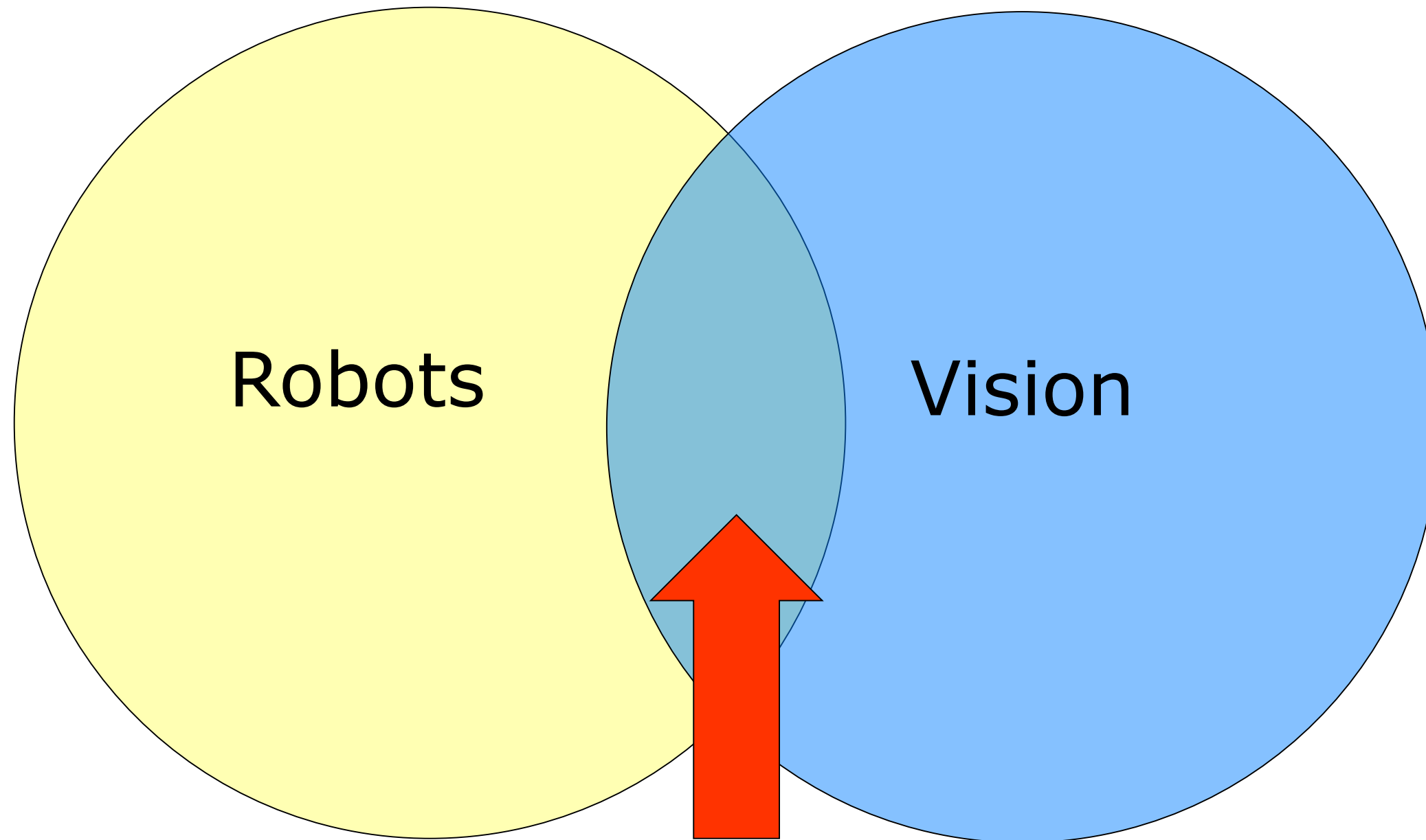
Robotics

"Artificial
Intelligence"
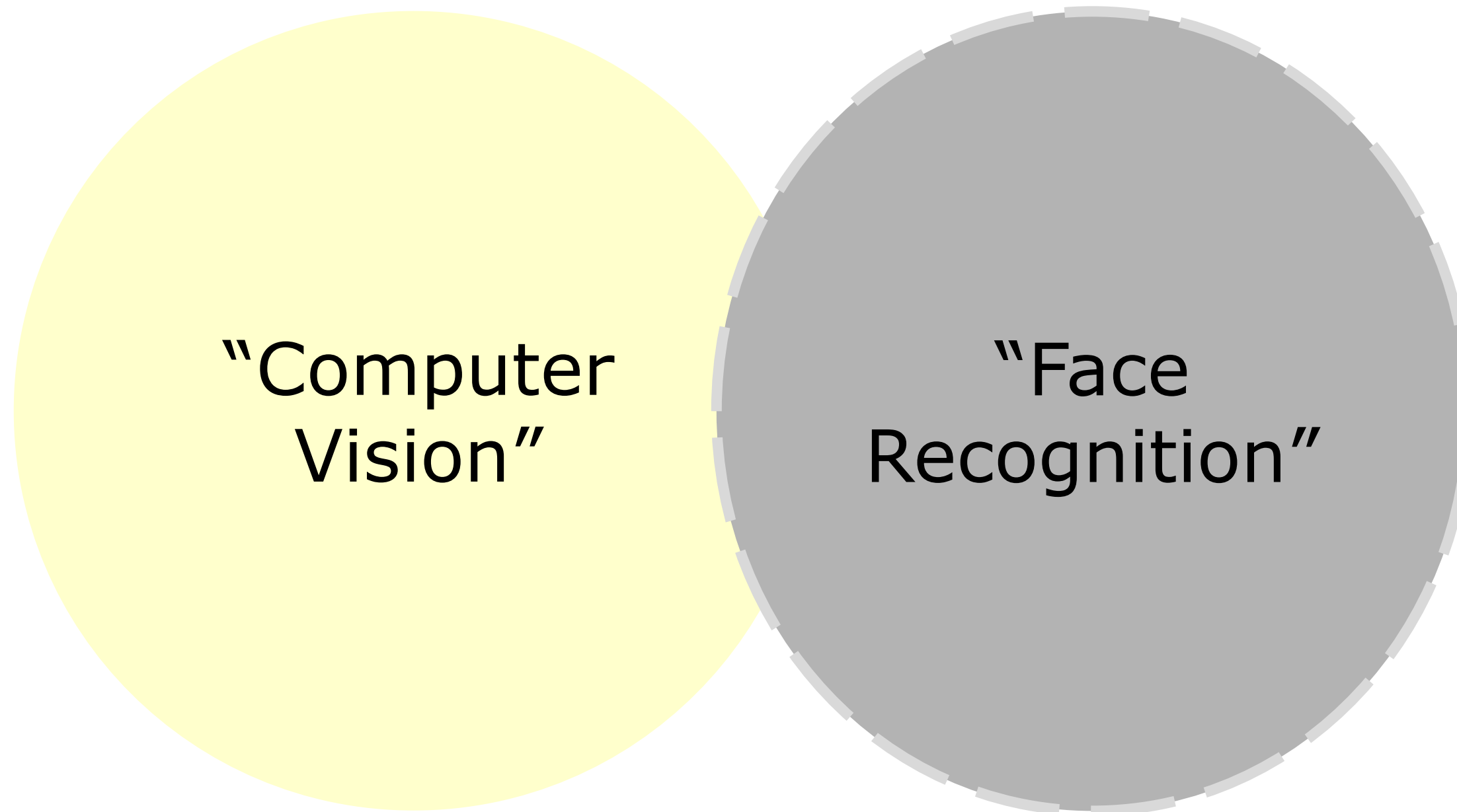
Boolean Operators

- (Robotics **OR** "Artificial Intelligence") **AND** Vision

- ("Robotics" **OR** "Artificial Intelligence") **NOT** "Face recognition"

Remember our topic? What keywords you can identify?

A key task in robotics is enhancing robot vision in challenging operational conditions. In particular, it is easy for humans to distinguish shadows, but it is more challenging for robots. A number of computer vision approaches have been proposed to deal with object recognition and classification in the presence of heavy shadow.

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Google Scholar

Strengths	Weaknesses
Easy to use	Google Scholar gives you what's popular first – not always what is most relevant
Breadth of coverage: all disciplines	Full-text not always available
Scholarly information: Journal article abstracts, theses, books, scientist homepages, public patent records	How scholarly is it?
Fast	Lots of results, hard to judge relevance, cannot refine
Good for locating a specific item (especially with incomplete details)	No controlled vocabulary to search by subject.

Identify
sources

Information on the web comes from different sources...here are some examples....

Home › Market Verticals › Automation

Market Verticals | Automation | Tech Trends | Technology Focus

Smart Robots Working Collaboratively With Humans

October 4, 2018

👁 3198   💬 0

Scientists all over the world are developing intelligent robots that can observe and learn from experience and human behaviour. The robots can then collaborate with humans across a range of sections.

A smart robot detects its environment, learns from it and responds accordingly. To detect the environment, it requires sensors like lidar, temperature, depth, proximity and camera. The sensors interact with the environment in real time and generate the required information and responses. The robot checks the information using various algorithms to generate the required responses as per the situation or scenario. It then decides how to act.

Pradeep Shoran, assistant general manager – marketing, Kuka Robotics, says, "We need to understand the requirements of a customer and then build our solution around it. The trend is moving towards greater customisation, more product variants, away from rigid mass production. Hence, personalised products that a customer can self-configure on a computer and order on the Internet are in demand.

Automatic illumination planning for robot vision inspection system☆

Hesheng Wang, Jingchuan Wang, Weidong Chen*, Lifei Xu

Department of Automation, Shanghai Jiao Tong University, and Key Laboratory of System Control and Information Processing, Ministry of Education of China, Shanghai 200240, China

ABSTRACT

High-quality original image is very important in robot vision inspection system and illumination is a significant component that directly affect cameras optical imaging system and plays a decisive role on image quality. To guarantee camera imaging system for high-quality images and achieve automatic illumination control in the motion of inspection robot under dark environment, this paper proposes an optimal light intensity planning method based image quality analysis. It is mainly achieved by building a computational model to automatically predict optimal light intensity values for desired image quality when camera observation distances fluctuate. Before regression modeling, it is necessary to extract discriminative features representing image quality. We design feature extractor by deep learning instead of human engineers which required careful engineering and considerable domain expertise. Deep learning methods are representation-learning methods that allows a machine to be fed with raw data and to automatically discover the representations needed for regression or classification. Experimental results demonstrate the feasibility and efficiency of this method.

1. Introduction

Traditional methods for robot vision to better interpret scenes are usually focused on image post processing like noise-reducing

to light intensity control, few works have been done, especially on automatic light intensity control. Among the few works, [1] proposed a close-loop control strategy for robot vision to obtain high-quality original images. They proposed the strategies that optimize

March 2019

IEEE Spectrum is a magazine edited by the Institute of Electrical and Electronics Engineers.

QUANTUM COMPUTING IS A MIRAGE
A PRACTICAL MACHINE MIGHT NEVER BE POSSIBLE P. 24

IEEE SPECTRUM

FOR THE TECHNOLOGY INSIDER 03.19

THE INTERNET OF COWS
HOW LoRa WIRELESS TECH MAKES IoT EASY P. 07

CHINA'S BID FOR GRID SUPREMACY
UPPING THE ANTE TO 1 MEGAVOLT P. 36

HERE'S HACKING'S

EXCLUSIVE SPECIAL DELIVERY
NIMBLE MACHINES WITH DYNAMIC LEGS WILL GO WHERE NO ROBOTS HAVE GONE BEFORE P. 30

Robotics | Cover Story

Building Robots That Can Go Where We Go

To be useful around people, robots need to learn how to walk like we do

By Jonathan Hurst

4 Artificial Intelligent Robots Slaughtered 29 Scientists at a Lab in Japan

Posted on 25, 2019 by adminyourmind

da M

"I received a phone call from a whistle blower in the Intel world I've known for ab
e is an honorably discharged ma le, but he continues to work on contracts
gencies. I always kee books all over my house, my office, my car, ev   rite
down a pho   rd or that I'm not in my studio to

a top ro   cations
killed 29 huma   n't know there
was any other kind

The scariest part is that lab wor   k apart the third, but the fourth
began restoring itself and somehow connected   orbiting satellite to download information about
how it could rebuild itself even more strongly than before.

Look at the <mark>references of your articles and track back</mark>…

Marc G. Dreyfus, (1974) "Visual Robots", Industrial Robot: An International Journal, Vol. 1 Issue: 6, pp.260-264

Visual Robots

Marc G. Dreyfus, BAI Corporation, Stamford Ct., USA.

INTRODUCTION

Equipment is now available for factory use to automate visual recognition, memorization, orientation, and inspection. Standard units scan a field of view in a thousandth of a second, extracting digitally-coded signals which are uniquely related to the observed field. These signals are further processed digitally on a real-time basis to automate visual functions. This equipment makes possible automation of visually controllable production operations at speeds, accuracies, and cost effectiveness which exceed human capacities by orders of magnitude.

RECOGNITION

Recognition is a basic function in visual automation. It is required for manufacturing operations involving alignment: for example, if a robot is to align an object for a machining or assembly operation, it must first somehow recognize the object and determine its orientation. Recognition is also a prerequisite for inspection. When a human inspector applies a micrometer to measure a part, he must first recognize the part and align it so that he can apply the micrometer properly. Because of its industrial value we will first show that visual recognition can be automated.
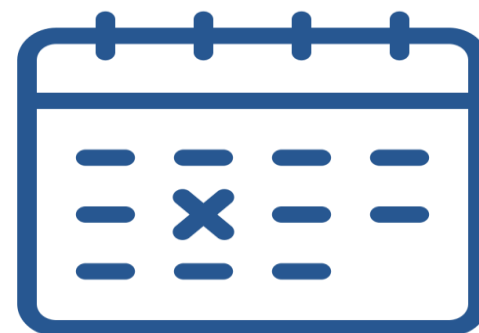In the process of recognition, we scan the object, ex-

Evaluate
results

Author

Date

Source

Supporting Sources

Purpose

Bias

N

What Is Peer Review?

In academic publishing, the goal of **peer review** is to **assess the quality** of articles submitted for publication in a scholarly journal. Before an article is deemed appropriate to be published in a peer-reviewed journal, it must undergo the following process:

- The author of the article must submit it to the journal editor who forwards the article to experts in the field. Because the reviewers specialize in the same scholarly area as the author, they are considered the author's peers (hence "peer review").
- These impartial reviewers are charged with carefully evaluating the quality of the submitted manuscript.
- The peer reviewers check the manuscript for accuracy and assess the validity of the research methodology and procedures.
- If appropriate, they suggest revisions. If they find the article lacking in scholarly validity and rigor, they reject it.

Because a peer-reviewed journal will not publish articles that fail to meet the standards established for a given discipline, peer-reviewed articles that are accepted for publication exemplify the best research practices in a field.

Document

Acknowledge the work of others:

- Avoid plagiarism
- Help readers trace the sources you used

You should attribute:

- Quotations,
- Paraphrased comments, and
- Any ideas originally presented by other authors.

Library / recite

SEARCH MENU

re:cite

Giving credit where it's due

A University of Melbourne library guide to referencing, citation, and acknowledgement in your research and essay writing.

CHOOSE YOUR CITATION STYLE, AND REFERENCE TYPE

+ APA

+ Harvard

Subject Research Guides

– http://unimelb.libguides.com/cis

Research consultation:

– library.unimelb.edu.au/research/research-consultations

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