SCSV Final Project - PSM (Project Sarjana Muda)

SCSV Thesis Dissertation

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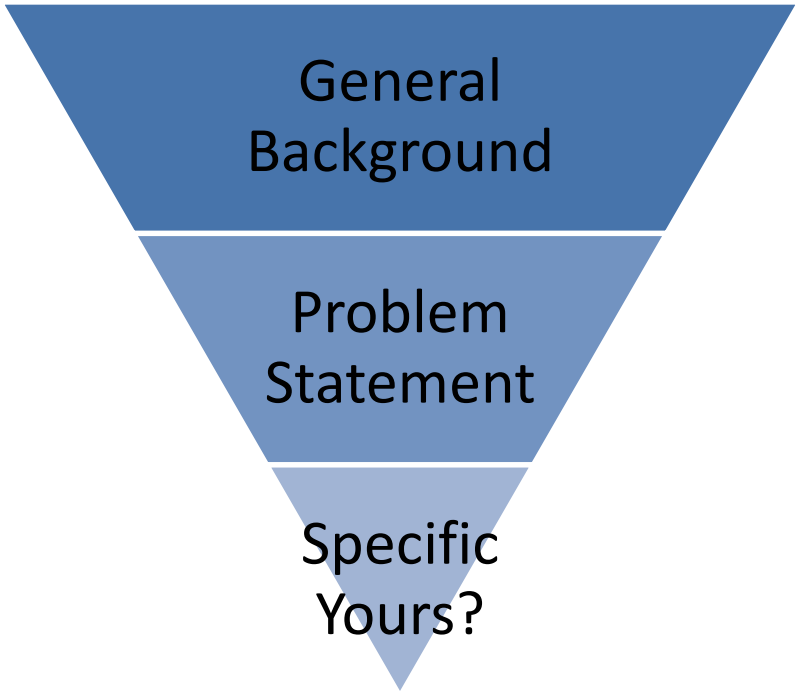
Thesis Pre-Preliminary Support

- **TITLE**
- **DECLARATION**
- **ACKNOWLEDGEMENTS**
- **ABSTRACT**
- **ABSTRAK**
- **TABLE OF CONTENTS**
- **LIST OF FIGURES**
- **LIST OF TABLES**
- **LIST OF ABBREVIATIONS**
- **LIST OF APPENDICES**

Chapter 1

- 1.1 Introduction
- 1.2 Problem Background
- 1.3 Problem Statement
- 1.4 Aim
- 1.5 Objectives
- 1.6 Scopes
- 1.7 Significance / Project Justification
- 1.8 Thesis Organization



Problem Background

- You need to be able to clearly answer the question: **"what is the problem"?** and **"why is this problem worth my attention"?** (this helps you define the RELEVANCE)
- To present the global and local issues surrounding the topic you will study, **you must know thoroughly the body of study/work/project**
- To select your focus area, what you are doing
- To present evidence of those issues, **the existing techniques/solutions and its limitation**

Problem Statement

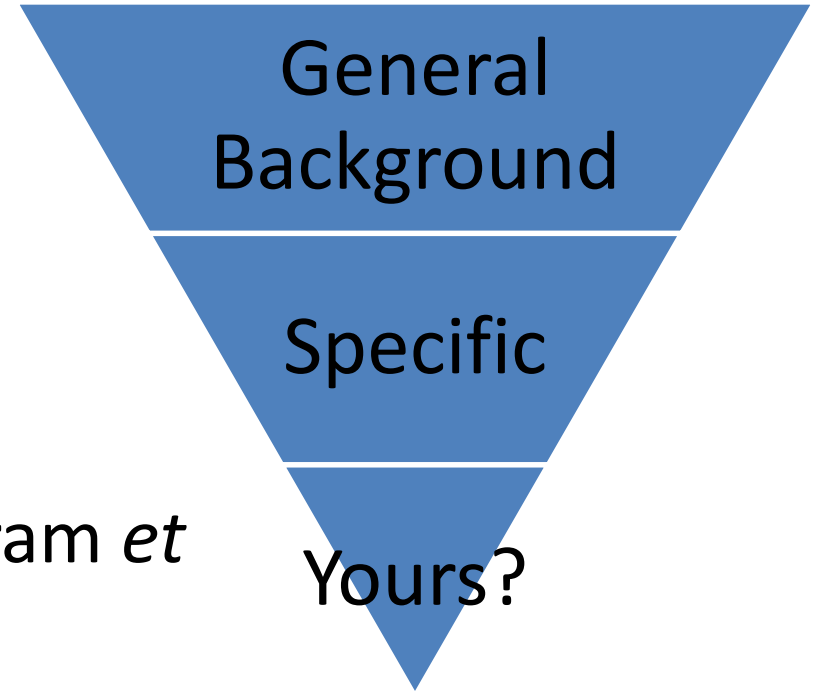
- To present the remaining issues surrounding the topic you will study, similar to the one you are proposing;
- To present evidence of those remaining issues
- To argue for the importance of your work to improve/enhance the remaining issues
- What change would you make for the proposed solution? Provide the questions

Literature Review

- Citation is a MUST
- Provide evidence to what statement you have agreed with or referred to.
- Two common styles:

Inline : As described by Milgram *et al.* (1994), …….

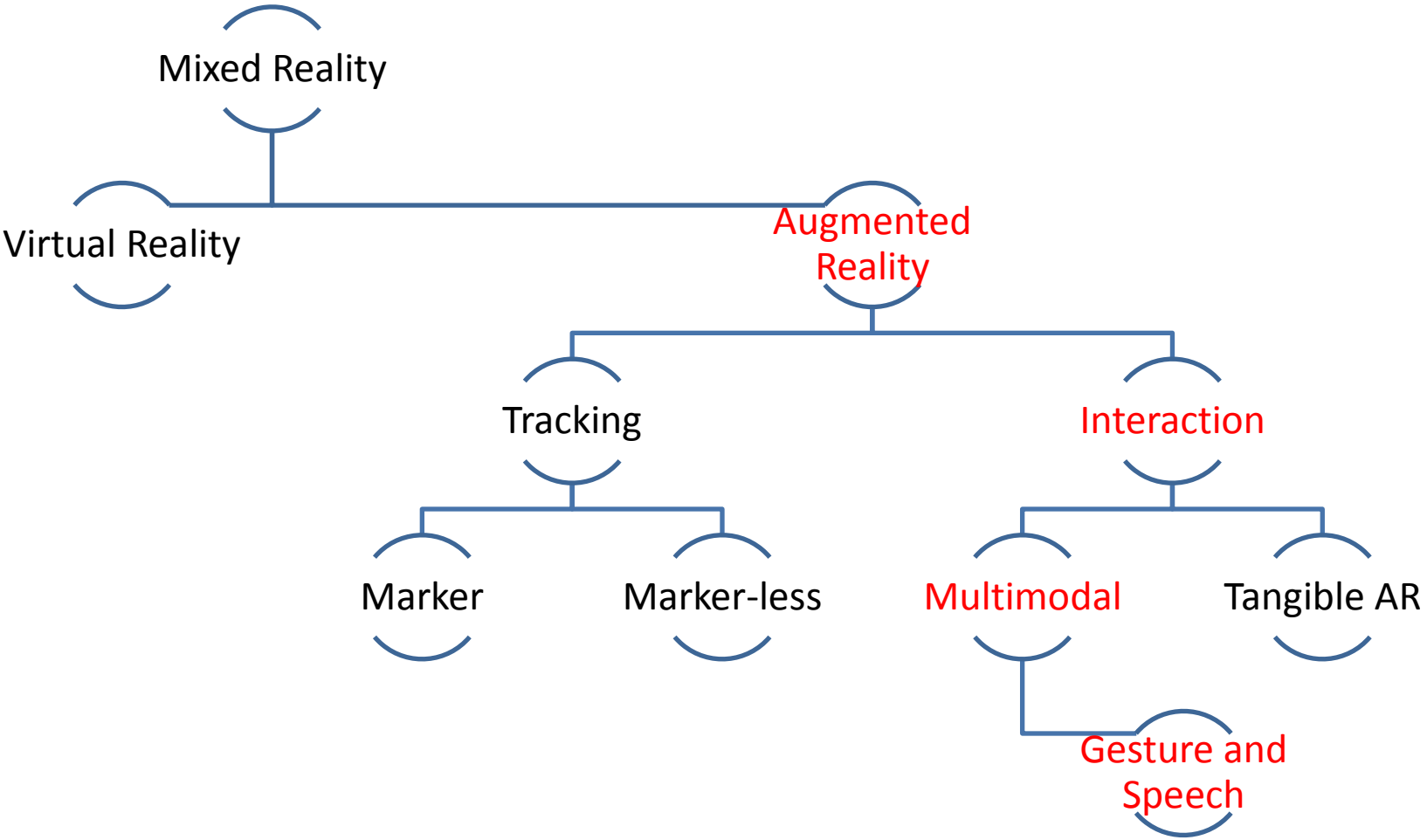
At the end : The interaction becomes more natural with accurate tracking technique (Billinghurts *et al.,* 2002).



Write your Literature Review?

- It is all about analysing previous researchers' contributions and review results to relate with your project
  1. Identify gaps in previous research
  2. Identify contradictions in previous research
  3. Identify faulty methodologies used in previous research (e.g. wrong assumptions, inappropriate comparisons, user studies with multiple variables)

Categorise your Literature Review?



Example : Chapter 2

2.1 Introduction – explain briefly about this chapter (2 paragraphs)

2.2 Augmented Reality

- State of the art
- Taxonomy of AR
  - Interface
  - Tracking
  - Display Technologies
  - Interaction

2.3 Interaction in AR – *WHY INTERACTION IS SO IMPORTANT*

- Tangible AR
- Multimodal interaction – *WHY IT BE CHOSEN COMPARED TO OTHERS*

2.4 Multimodal using Gesture and Speech – *WHAT OTHERS HAVE DONE? AND COMPARE TO YOURS (PRESENT A TABLE TO COMPARE)*

2.5 Previous Works – *THE MAIN REFERENCE FOR YOUR PROJECT*

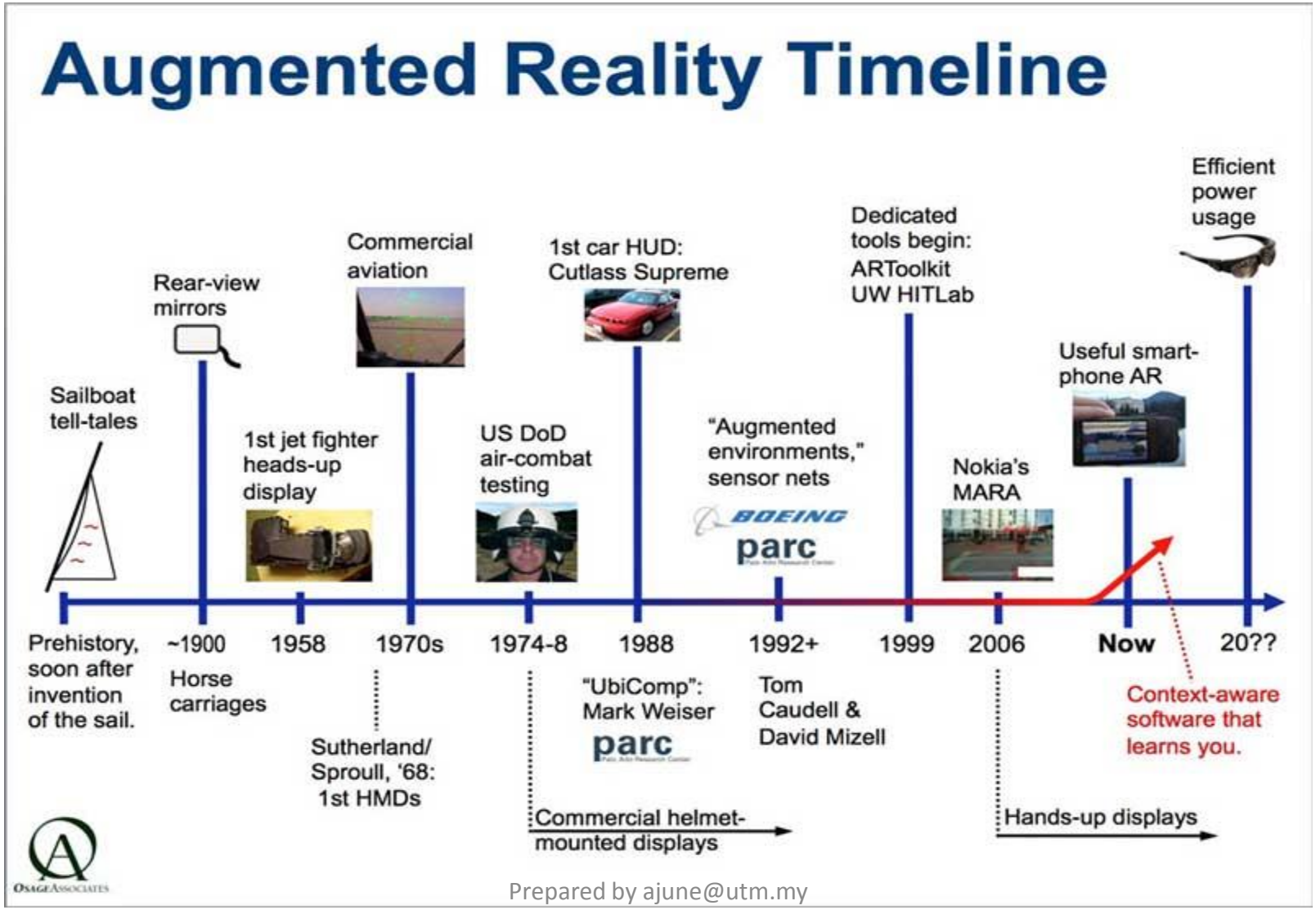
2.6 Discussion – *DISCUSS ABOUT THE CHAPTER ALL ABOUT*

Comparative table / timeline figure

- Example 1 : Analysis table

	SVG	DHTML	VRML97	X3D	Java3D
Technical Capabilities					
Communications	Limited	Very Limited	Limited	Limited	Yes
2D	Yes	Yes	Yes	Yes	Yes
3D	No	No	Yes	Yes	Yes
Compression	Yes	No	Yes	Yes - encrypt	Yes
Animation	Very Good	Limited	Interpolation	Interpolation	Programmable
Ease of Creation	Easy	Easy	Moderate	Moderate	Difficult
Interactivity					
Intra-element events	Event Model	Event Model	Route Model	Route Model	Composite
Scripting Support	Java/JavaScript	JavaScript	Java/JavaScript	Java/JavaScript	Java
Dynamic Update	Yes (w/ Adobe)	Yes-limits	Plug-in dpndnt	Plug-in dpndnt	Yes
Inter-element communication	Limited	Full	IE Only	IE Only	Full
Support					
Plug-in ubiquity	Very Good	n/a	OK	Poor	OK
Standards Based	Yes(2001)	Yes	Yes(1997)	Yes(2003)	Yes
Cross-Platform	Yes	Yes	Yes	Not Yet	Yes
Application Specific					
Native Structures	Simple	No	Good	Good	Programmable
Previous Use	Many	Many	Prevalent	Emerging	Emerging

- Example 2 : timeline figure



- Example 3 : Compare unimodal vs multimodal

Characteristics	Unimodal Interface	Multimodal Interface
Input modalities	Single	Multiple
Output modalities	Single	Multiple
Usability	Less	More
Accessibility	Less	More

- Example 4

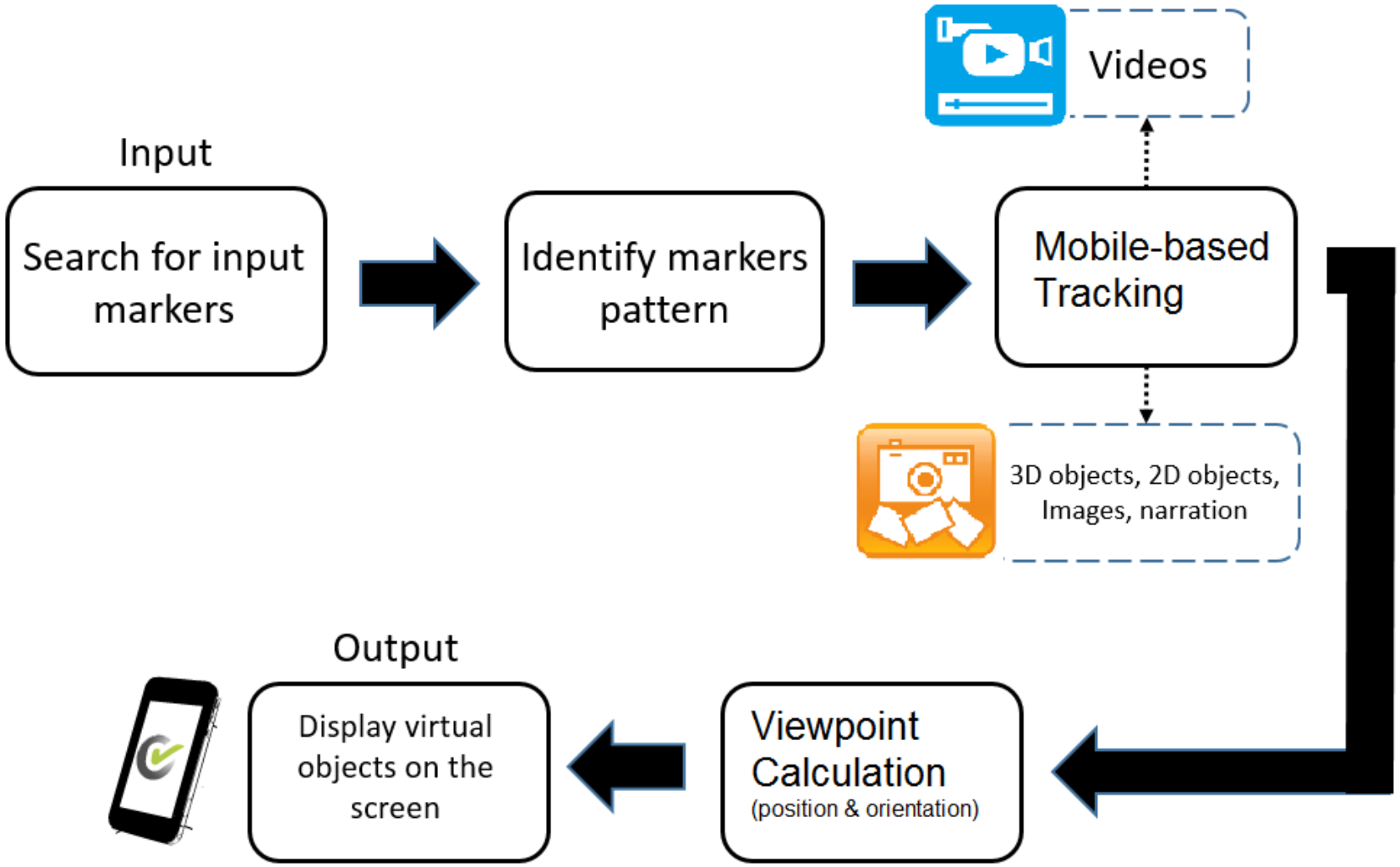
Sub-systems	Virtual Reality	Augmented Reality
Tracking devices	**Less advanced** - Indoor sensors like camera and movement sensors are used	**More advanced** - Uses a combination of indoor and outdoor devices
Scene Processor	**More advanced** - Needs to render a complete virtual environment	**Less advanced** - Needs to process information from various sources and superimpose it to the user 's view
Display Device	**High quality** - Incorporates heavy graphics to create a virtual environment	**Low quality** - Adds relevant information to existing real world view

Methodology

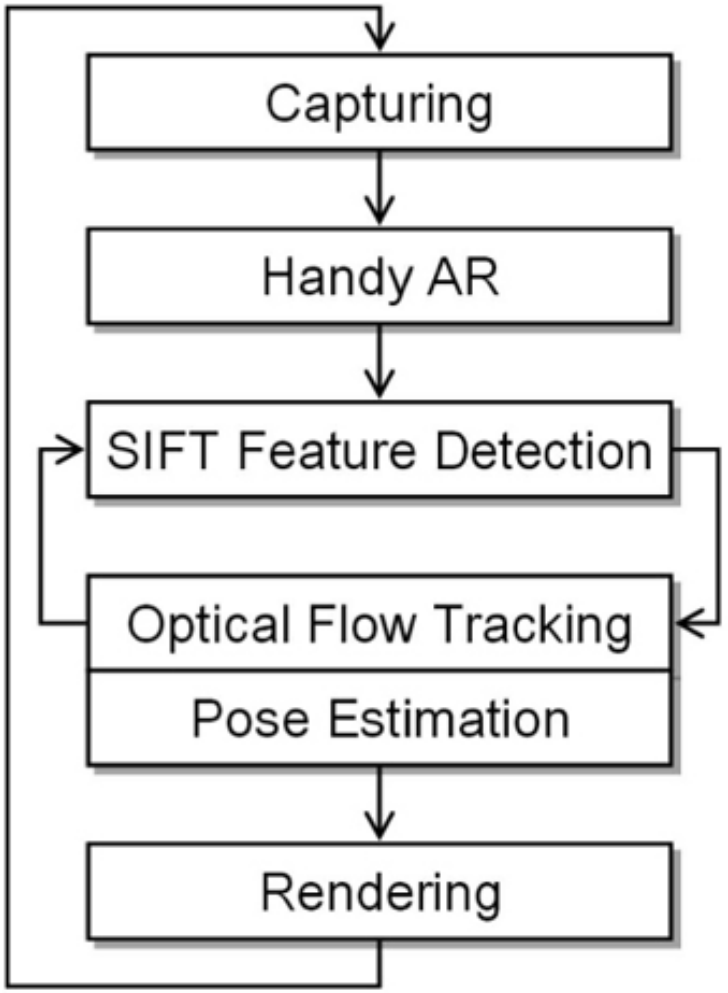
- The purpose of the Specification and Design sections is to give the reader a clear picture of the system you plan to create, in terms of the capability required.
- A specification should tell the reader what the software system is *required* to do.

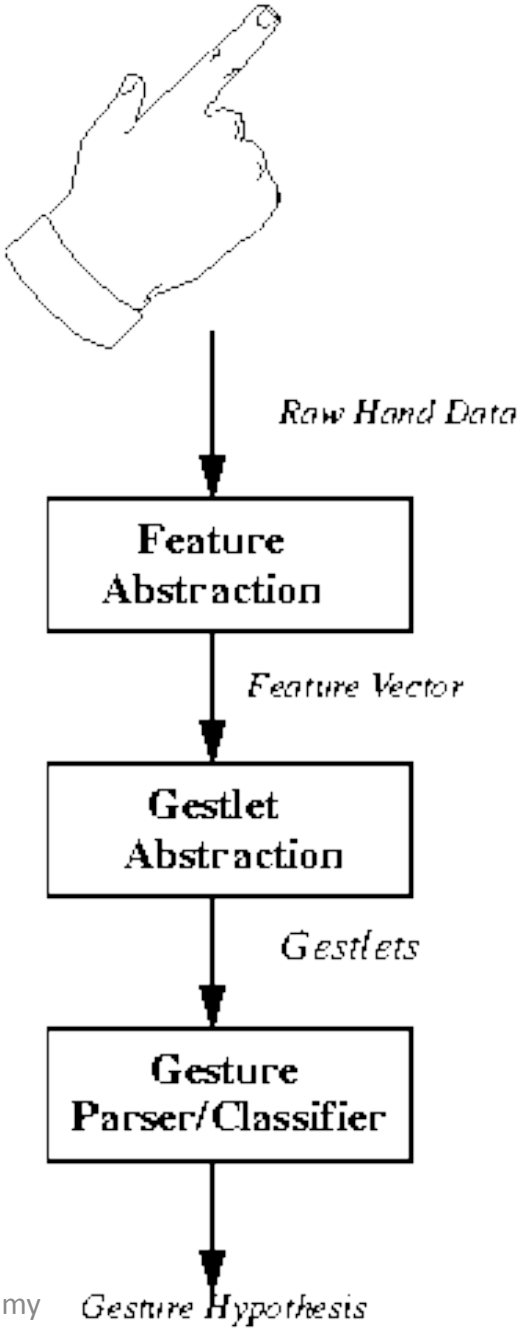
a) the user interface;
b) the conceptual of the system;
c) how data flows through the system;
d) what data types & what algorithms are implemented in the system;

Standard Procedure/Processing

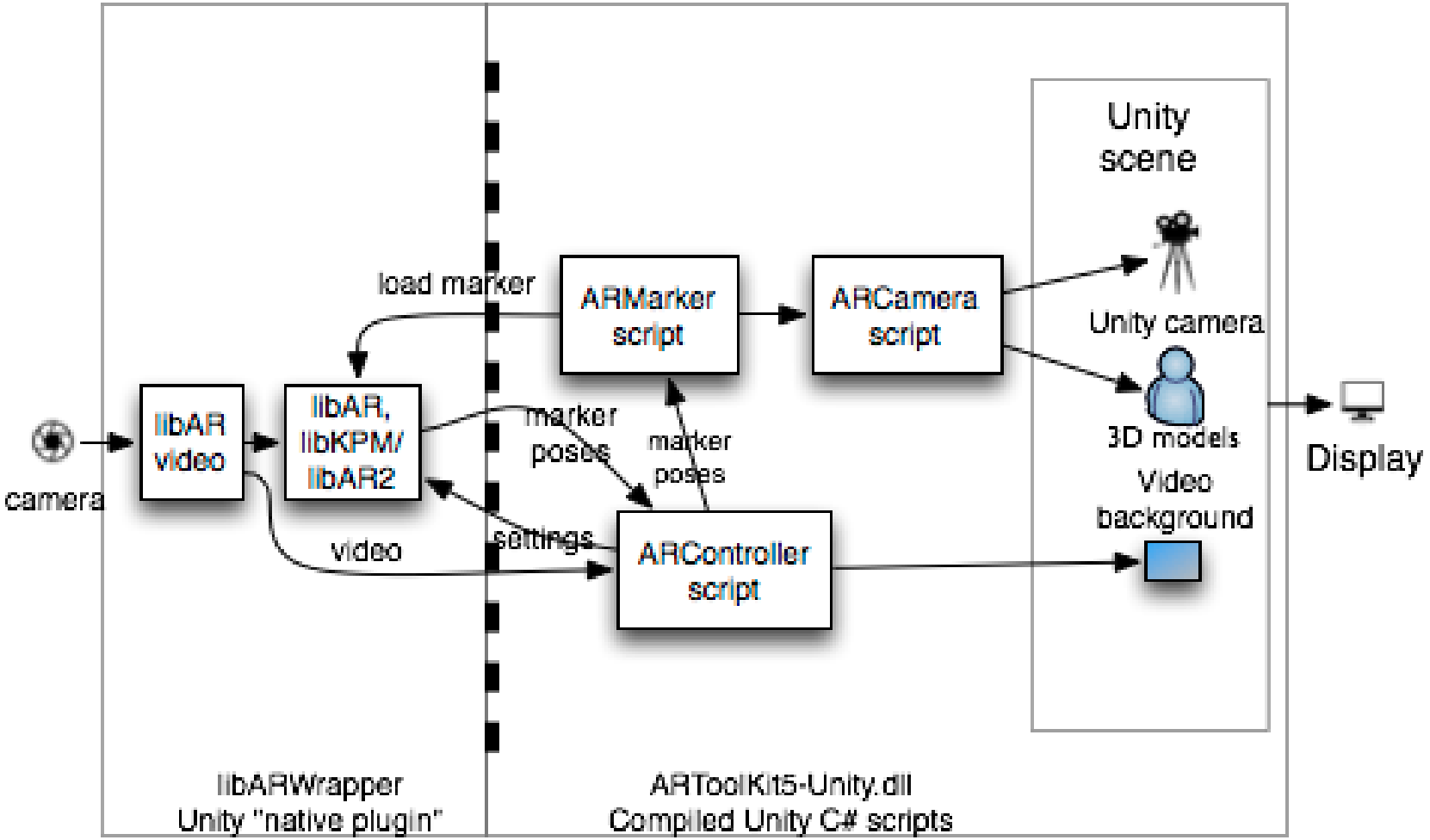


FLOW


Capturing
Handy AR
SIFT Feature Detection
Optical Flow Tracking
Pose Estimation
Rendering


Raw Hand Data
Feature Abstraction
Feature Vector
Gestlet Abstraction
Gestlets
Gesture Parser/Classifier
Gesture Hypothesis

Functional Schematic

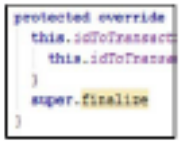


Design vs. Implementation

Design (Solutions)

- Abstract, high-level
- Algorithms & equations
- Mostly independent of particular technologies, and tools
- Could be applied in many different projects, implemented in many different systems
- Consists of the contributions

Implementation (Prototype)



- Concrete, low-level
- Code segments (if at all)
- Build using particular technologies and tools
- Just one example of how the solutions (esp. the contributions) were applied
- Merely used to illustrate / demonstrate contributions

Implementation

- The Implementation section is similar to the Specification and Design section in that it describes the system, but it does so at a finer level of detail, down to the code level.
- This section is about the realisation of the concepts and ideas developed earlier. It can also describe any problems that may have arisen during implementation and how you dealt with them.

- Complete source code should be provided separately
- You should also mention any unforeseen problems you encountered when implementing the system and how and to what extent you overcame them. Common problems are:

a) difficulties involving existing software, because of, e.g.,
   - its complexity,
   - lack of documentation;
b) lack of suitable supporting software;
c) over-ambitious project aims.

Implementation

- Example

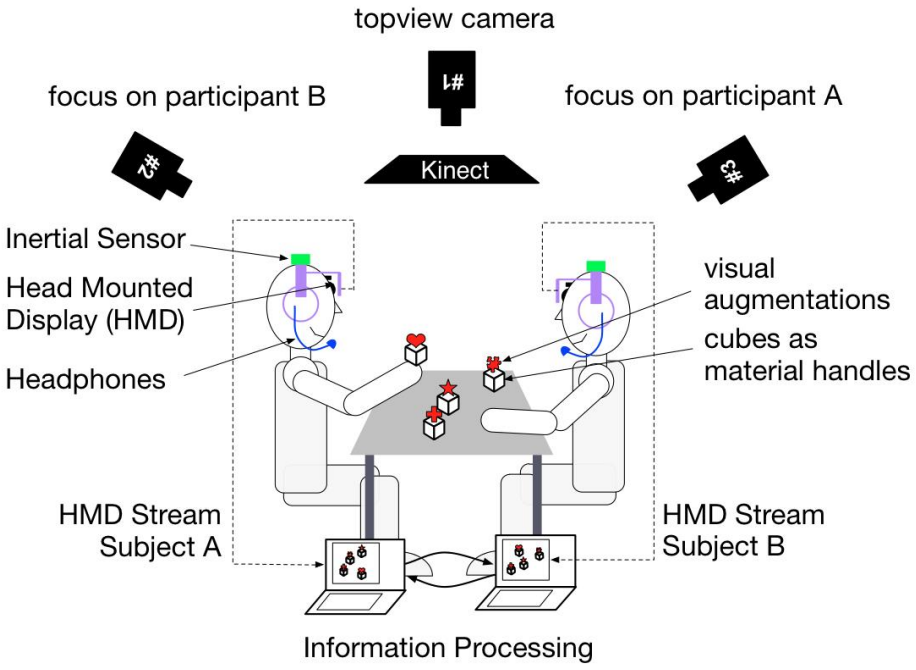


Figure 1: *AR System (dyadic)*

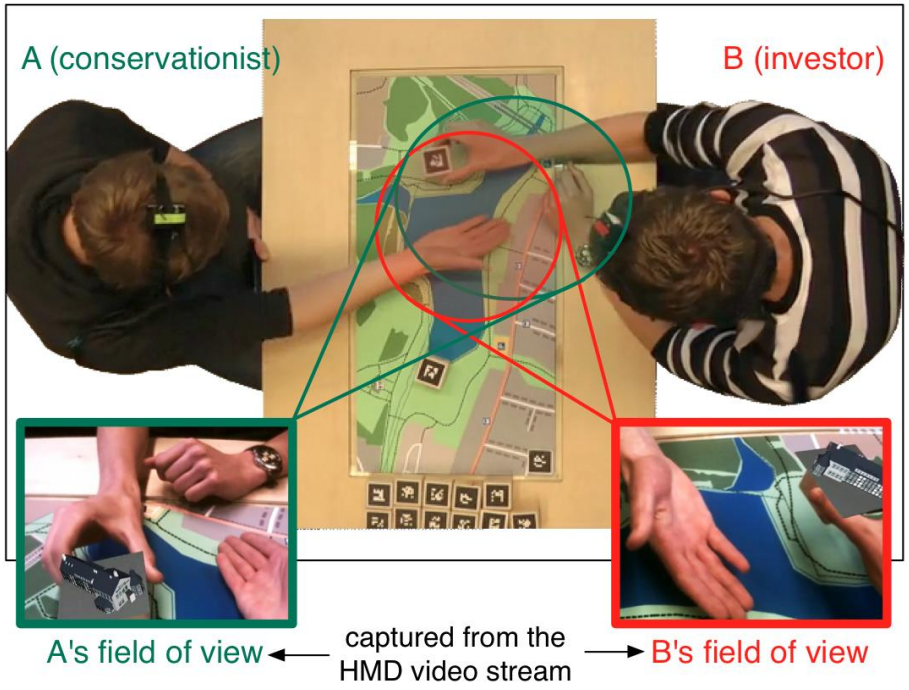
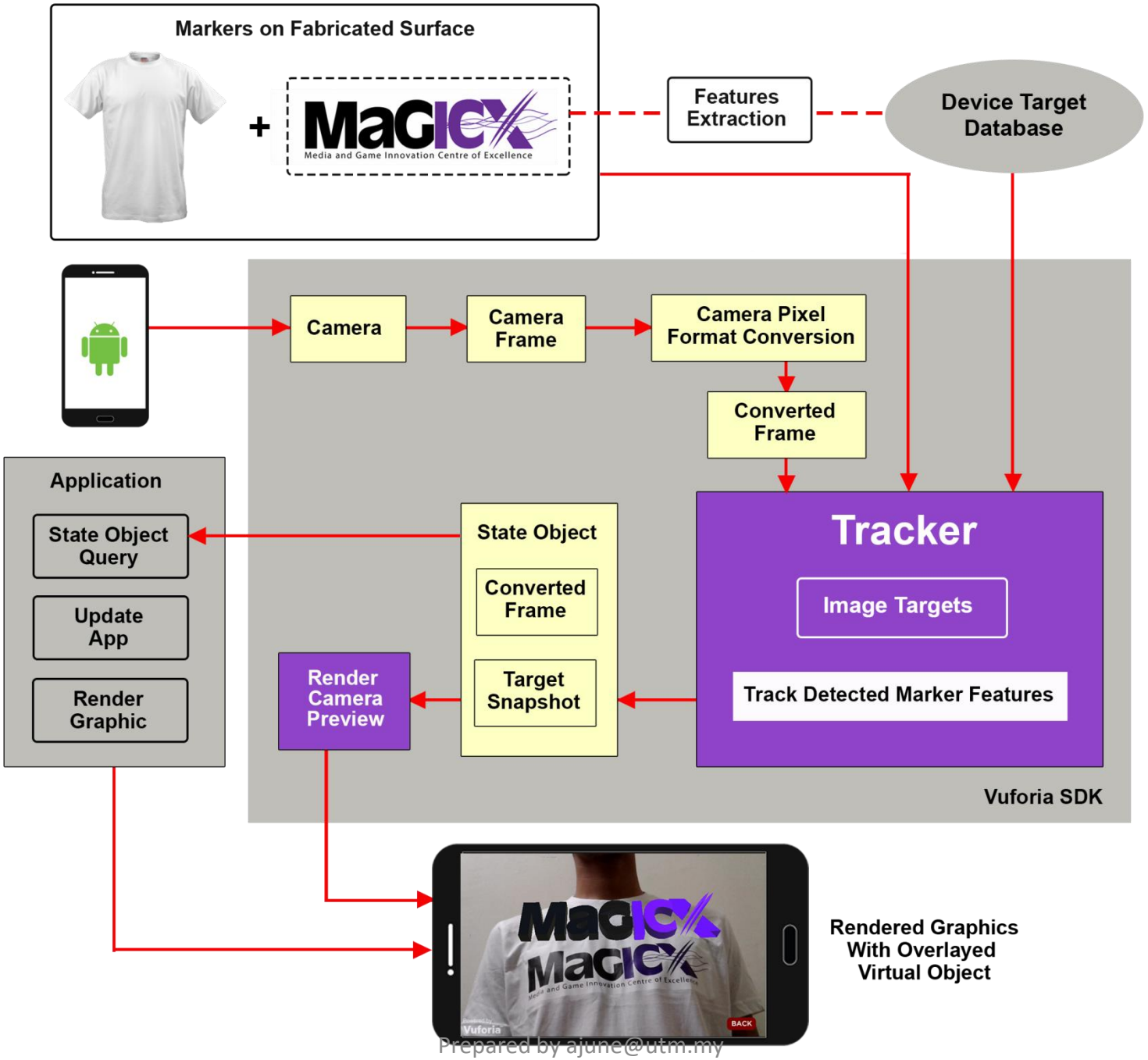
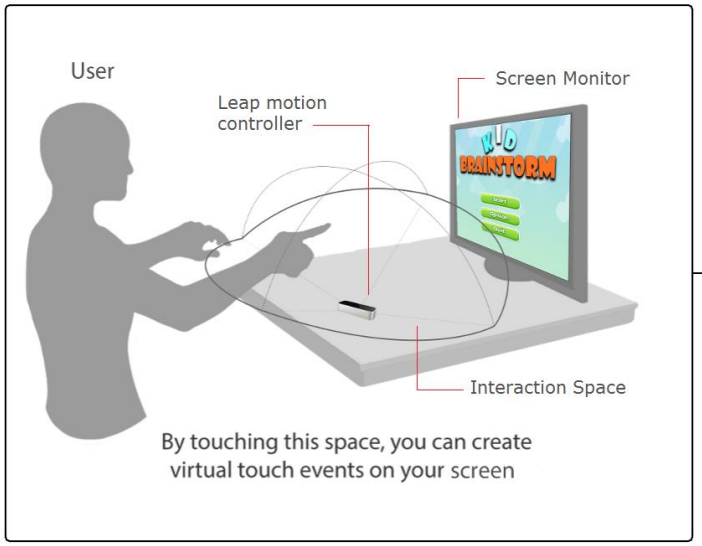


Figure 2: *AR System in use with Obersee scenario*

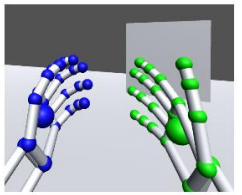


Framework



HAND GESTURE RESPONSE TO 3 MINI GAMES

Detect Gesture Input from Leap Motion



Create Obstacle

Shape Game

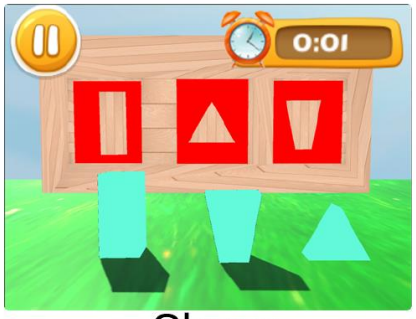
Numbering Game

Colour Game

UNITY 3D

APPLICATION

Numbering



Shape

Colour

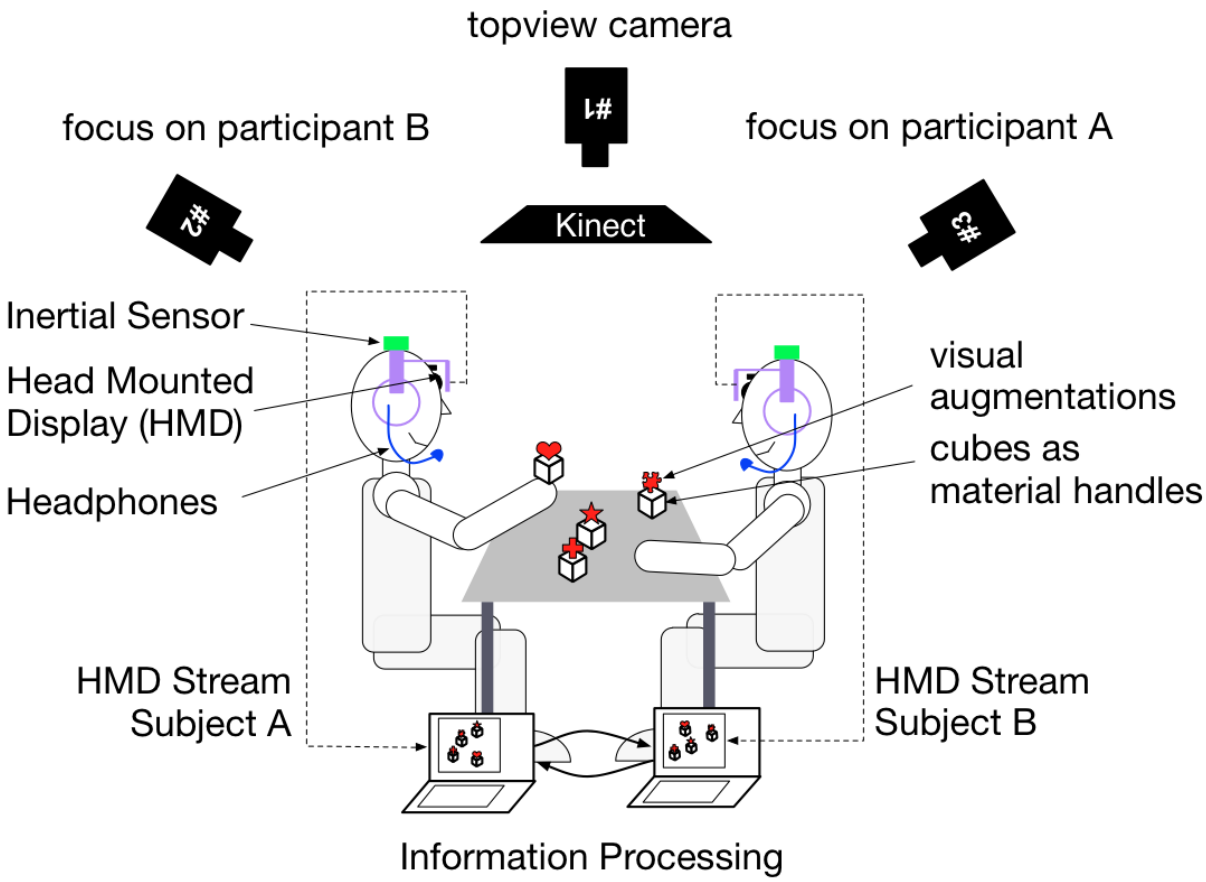
Results and Evaluation

- In this section you should describe to what extent you achieved your goals.
- You should describe how you demonstrated that the system works as intended (or not, as the case may be). Include comprehensible summaries of the results of all critical tests that were carried out.
- You should try to indicate how confident you are about whatever you have produced, and also suggest what tests would be required to gain further confidence

- This is also the place to describe the reasoning behind the tests to evaluate your results, what tests to execute, what the results show and why to execute these tests.
- It may also contain a discussion of how you are designing your experiments to verify the hypothesis of a more scientifically oriented project.
- E.g., describe how you compare the performance of your algorithm to other algorithms to indicate better performance and why this is a sound approach. Then summarise the results of the tests or experiments.

PSM 1 : EXPECTED RESULTS

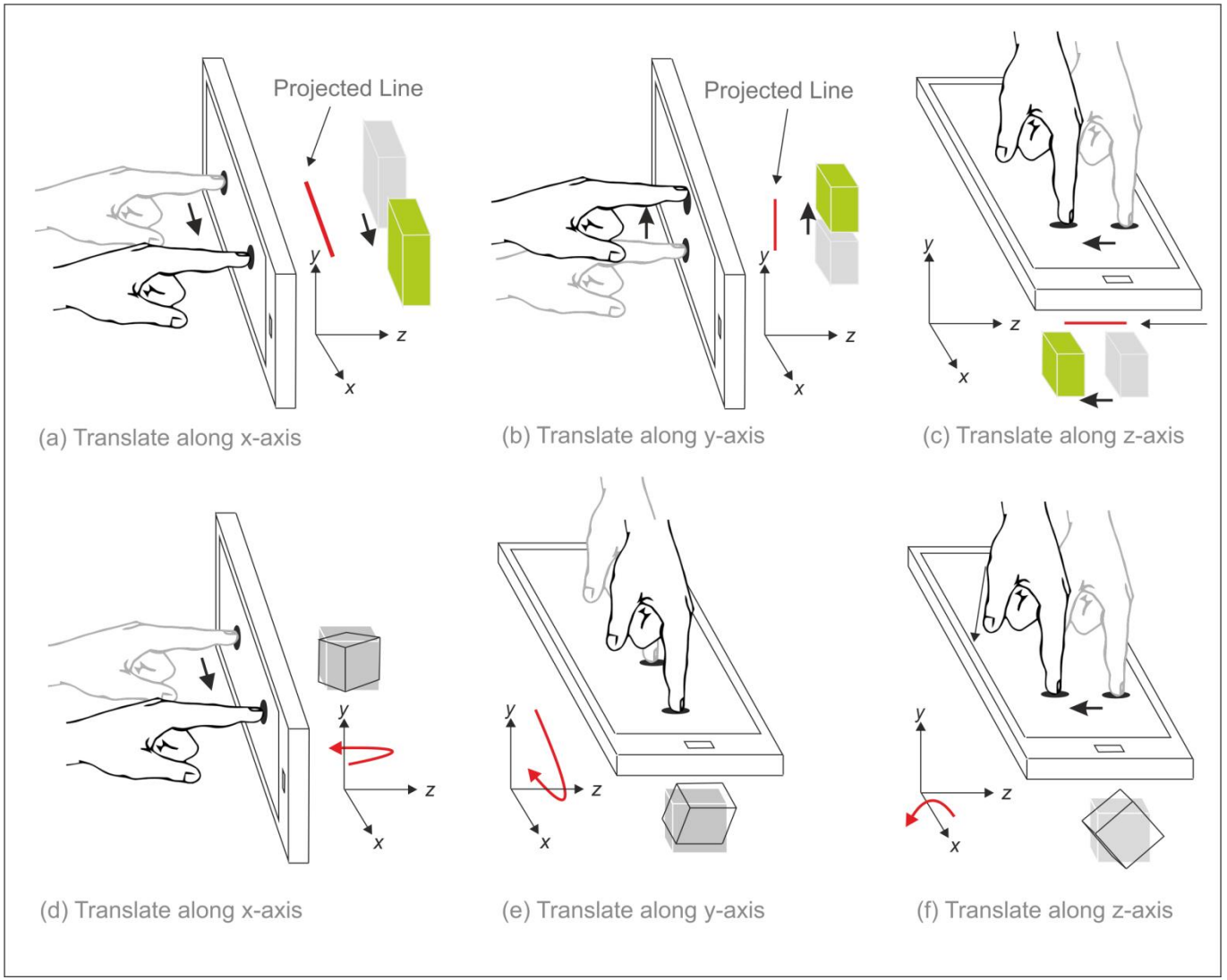
- Project Procedure & Setup



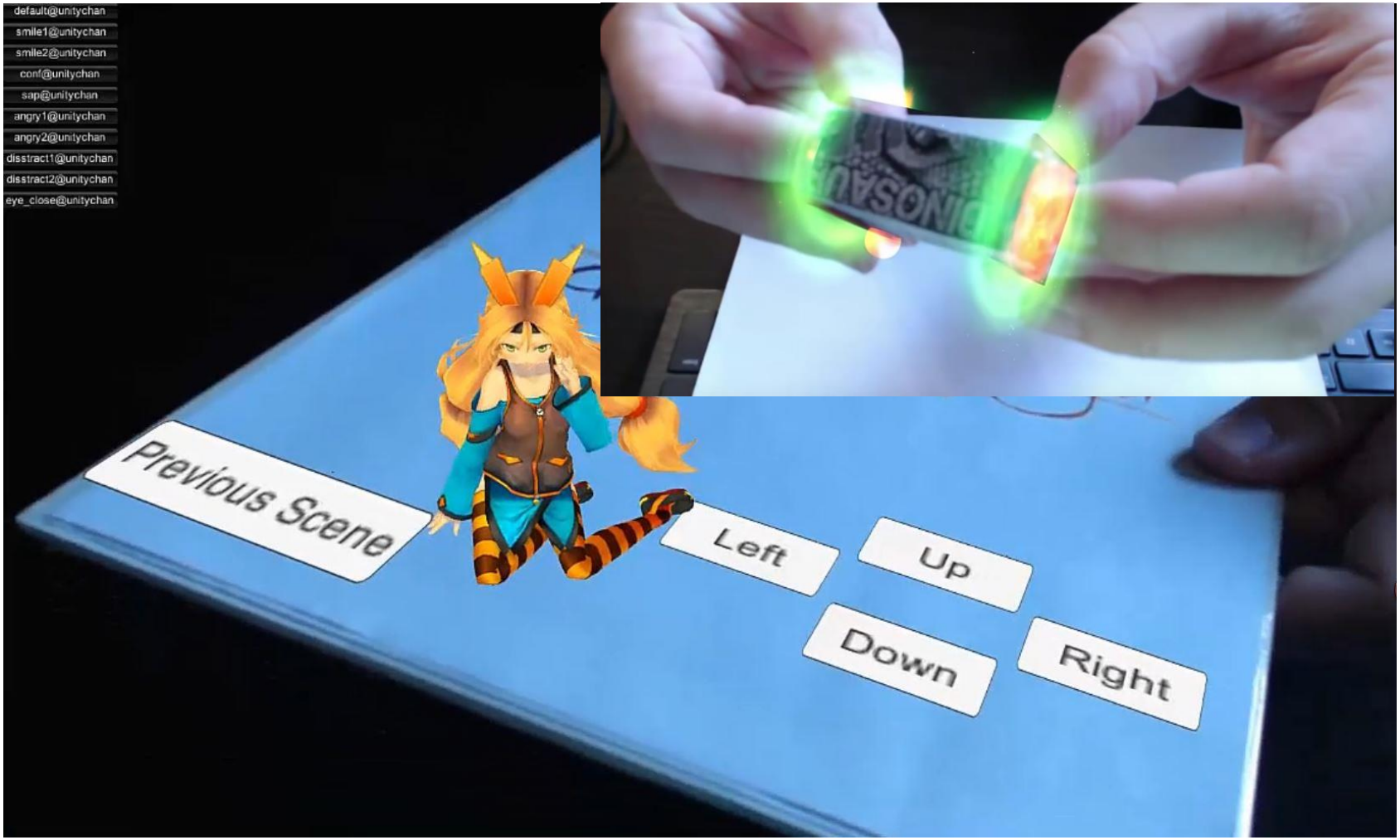
Expected Metaphor/Technique

- Draw/

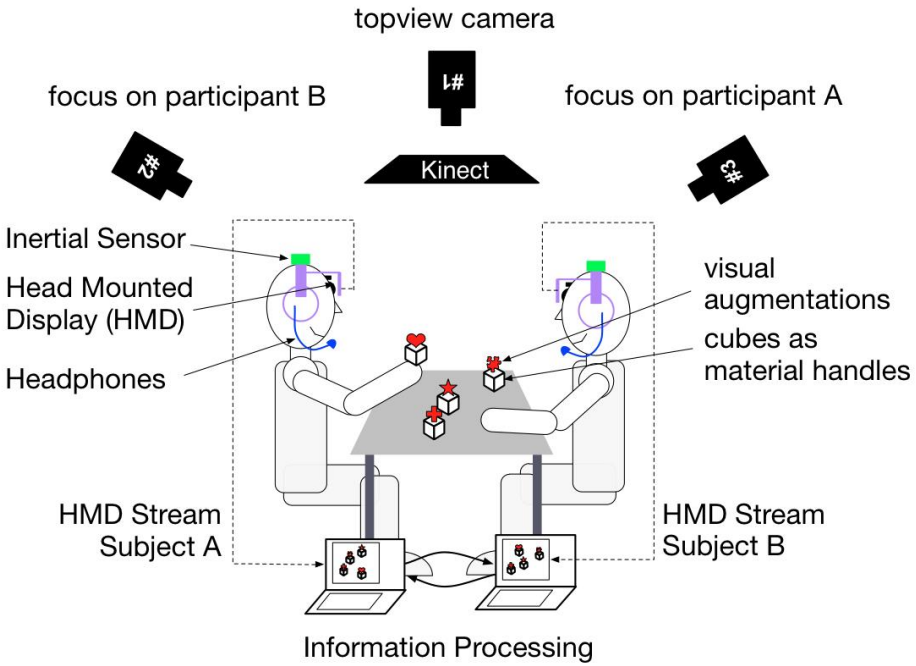
Sketch

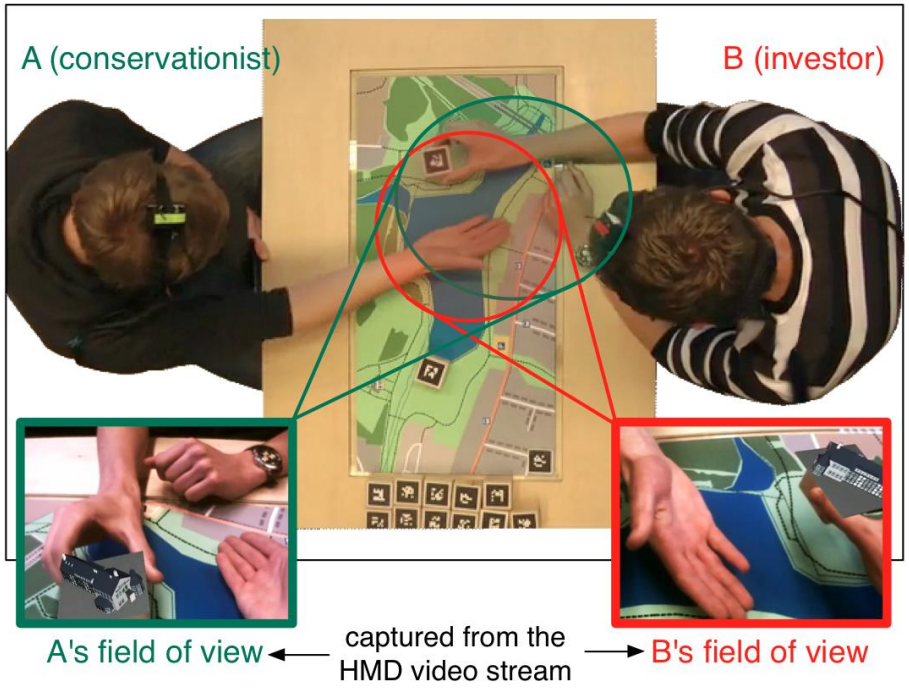


Expected Application/Prototype



PSM 1 vs PSM 2

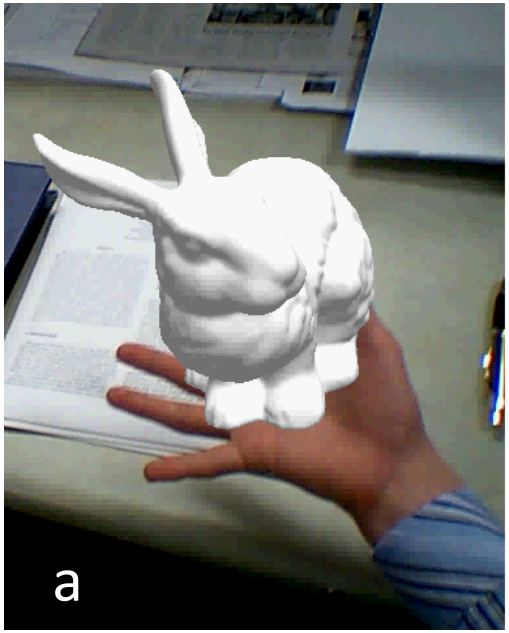


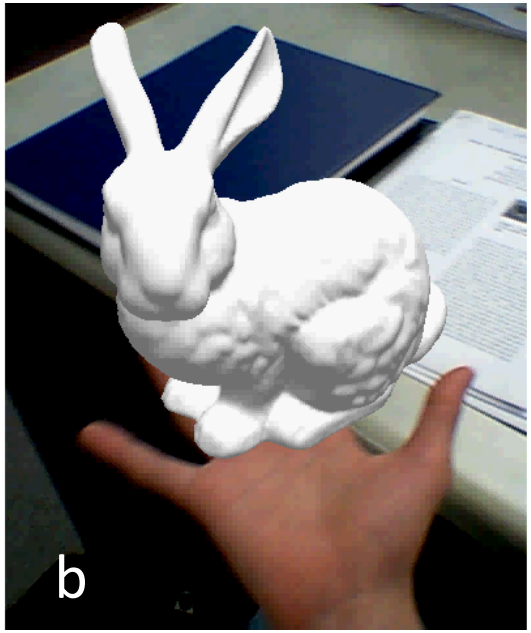


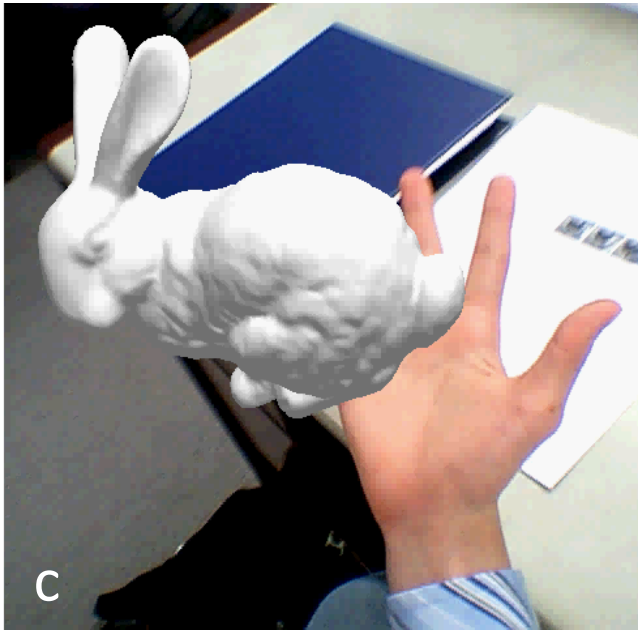
PSM 1

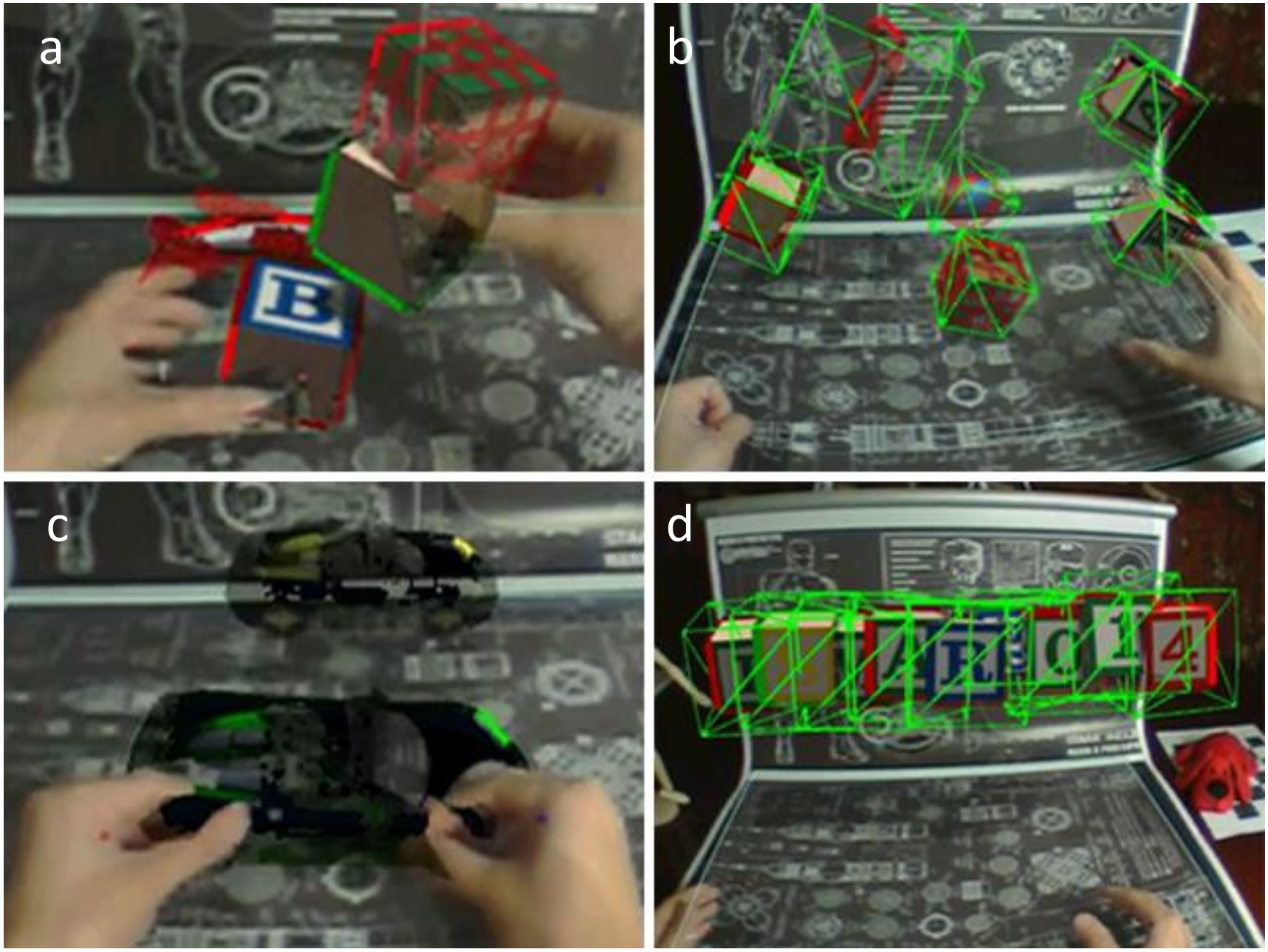
PSM 2

PSM 2 : RESULTS








a
b
c
d

PSM I

- **CHAPTER 1. Introduction**: What is the research problem?
- Introduce and motivate it. Summarize your contributions.
- **CHAPTER 2. Literature Review:** What have others done? How is it different? Cite, summarize other solutions & compare it with your own.
- **CHAPTER 3. Methodology:** Propose your solution. Provide FLOWCHART to represent the whole project. Motivate design (what you will do and why?) Provide enough details so others can implement / replicate it. Software architecture (e.g. class diagram - optional)? User interface (e.g. screenshots)? Figure? Algorithms?
- **CHAPTER 4. Expected Results:** How have you suggested to your solution? Tools and technologies are going to use? Expected implementation framework and challenges?
- **CHAPTER 5. Conclusion**: Summarize contributions. Draw conclusions (e.g. implications in practice, guidelines, lessons learned). Point out future work.
- **References** : NOT you tube link, NOT wikipedia link, NOT blogs. Website only on the official site (e.g. www.kinect.com, www.leapmotion.com) Find the references on the related papers/reports/journals extracted from **Google scholar (IEEE/Springer/Books/Reports)**

PSM II

- **CHAPTER 1. Introduction**: What is the research problem? Introduce and motivate it. Summarize your contributions.
- **CHAPTER 2. Literature Review:** What have others done? How is it different? Cite, summarize other solutions & compare it with your own.
- **CHAPTER 3. Methodology:** Your solution - development phases of the project, i.e. variables, tasks, methods etc. Provide enough details so others can implement / replicate it. User interface (e.g. screen diagram)? Algorithms? describe how you conducted the testing and evaluation (cited the testing procedure standard)
- **CHAPTER 4. Implementation:** How have you implemented your solution? Tools and technologies used? Implementation challenges?
- **CHAPTER 5. Evaluation and Results:** Explain the methodology you used for evaluation. Present the results. Discuss them. summarize the data that was collected (qualitative and quantitative)
- **CHAPTER 6. Conclusion**: Summarize contributions. Draw conclusions (e.g. implications in practice, guidelines, lessons learned). Point out the achievement, limitations and future works.
- **References** : Find the references on the related papers/reports/journals extracted from **Google scholar (IEEE/Springer/Books/Reports)**