Introduction to Intelligent Vehicles
[Appendix-1118]

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Outline

- **Oral Presentation**
- Report
- LaTeX

Project Presentation

- Timing control
  - 8-minute presentation
  - 1-minute Q&A
  - 1-minute transition
- Something you can talk about
  - Project topic
  - Reason to select the topic
  - Existing work
  - Current progress or results
    - "Why"?
  - Following plan
- Use your creativity to be attractive and informative

Oral Presentation Skills

- Enthusiasm and confidence
  - (I feel that they are not skills)
- Clear and appropriate language
- Appropriate speed and volume
- Smooth transition
- Timing control
  - How much time do you need for one slide?
    - Timing analysis by simulation
- Posture
- Eye contact
- Avoiding verbal distraction
- Avoiding "reading slides"

Slides Preparation

- Consistent format
- Appropriate font
- Appropriate color
- Comfortable layout
- Less text if possible
  - Reasonable grammar
  - Lecture slides may be different
- Figure instead of text to show the same thing
  - (If you have time…)

Outline

- Oral Presentation
- **Report**
- LaTeX

Paper Outline

- ❑ Introduction
- ❑ Previous work or related work (survey)
  - ➢ Can also be in "Introduction" or before "Conclusions"
- ❑ (Preliminary)
- ❑ Formulation
- ❑ Proposed approach (research)
- ❑ (Extension)
- ❑ Experimental results (implementation)
- ❑ Conclusions
- ❑ (Appendix)

Introduction

- What is the background?
  - Examples
    - Connectivity brings remote accesses
    - Human may not react due to autonomy
- Why is the topic important?
  - Example
    - It is a safety-critical system, and thus a security attack is life-threatening
- What is the problem?
  - Example
    - Message authentication
- What are your contributions?

Previous Work

- Search good conferences or journals
  - ACM Digital Library and IEEE Xplore
    - Not all ACM or IEEE papers are good
  - More, depending on domains
  - arXiv?
- Read papers in a high-level way
- Pick relevant papers for detailed survey
  - Maybe few for your experimental comparison
- Compare those papers, if needed
  - Strength, limitation (try to be neutral), reason
- Write them down
  - Categorize papers and follow some logic, e.g., chronologically

Formulation

- Must be well-defined
  - Input
    - Given variables
  - Output
    - Decision variables
  - Objective
  - Constraint
- There can be many "definitions" before the formulation
  - Example
    - Define a task, a signal, an Electronic Control Unit, a message, and their parameters
    - Then define the formulation of the mapping problem
  - If space allows, there can be a notation table

Proposed Approach

- Flowchart
- Step-by-step
  - Pseudocode?

- Explain not only "what" but also "why"

Experimental Results

- Experimental setting
- Fair comparison

- Explain not only "what" but also "why"

General Writing Guidelines

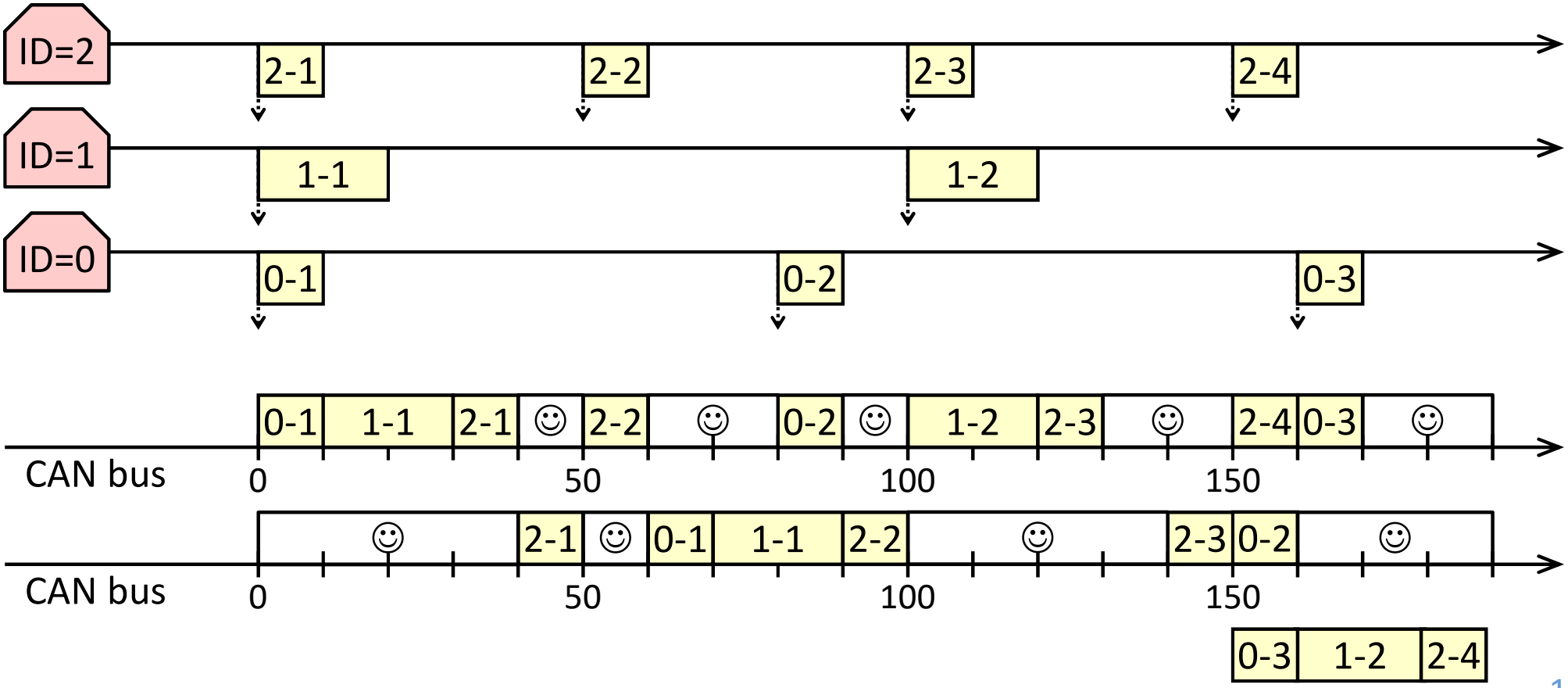
- Logic!!!
- Figure
- Consistency
  - Take a note, if needed
    - Complexity: $\theta(n^2)$
  - Examples
    - Vertex vs. point
    - Figure vs. Fig.
    - Leading vehicle vs. preceding vehicle
- Defensing your claims immediately
- Exaggerating too much is not good

English Writing Tips

- Singular vs. plural
- Indefinite article vs. definite article
  - A student asks me a question
  - A student asks me the question
  - The student asks me a question
  - The student asks me the question
- The summary of a paragraph should come first
- English usage
  - Efficient vs. effective
  - Sophisticated vs. complicated
  - Because, because of, due to, thus, and, but, however, although, ...

Golden Rule?

- This is the example in our lecture
  - Fault tolerance
  - Comfort and happiness?
  - One assumption here: efficiency is the same



Outline

- Oral Presentation
- Report
- **LaTeX**

Installation

- Option 1 (offline)
  - MiKTeX
  - Texmaker
- Option 2 (online)
  - Overleaf
- Software for figures
  - Any tool which can print and crop pdf
- From .tex to .pdf
  - "pdflatex filename"
    - Sometimes, it needs twice for cross referencing

Introduction

- Latex is often used for technical or scientific documents
  - Suitable for the general layout of a paper
  - Automatic to number figures, tables and so on
  - Good to present mathematical equations

Section and Lists

```
\section{Background}

\subsection{Automotive Plug-and-Play Scenarios}

As shown in
```

II. Background

A. *Automotive Plug-and-Play Scenarios*

As shown in Figure 1, some plug-and-play scenarios which are happening or expected to happen in the future are introduced as follows:

```
\begin{itemize}
\item \textbf{\underline{At Dealership}}. Traditionally ...
\item \textbf{\underline{Before Driving}}. One ...
\end{itemize}
```

- **At Dealership**. Traditionally, customers can only purchase available vehicles at dealerships or wait until specific vehicles shipped from other dealerships or factories. With plug-and-play features, vehicles can be customized and delivered to customers much sooner. This can effectively enhance user experience by providing desired settings for customers and reducing waiting time.
- **Before Driving**. One recent trend is to enable the in-

```
\begin{enumerate}
\item \textbf{Level~1: Basic Contracts}. They ...
\item \textbf{Level~2: Behavior Contracts}. They ...
\end{enumerate}
```

1) **Level 1: Basic Contracts**. They define the interfaces of components, probably by interface definition languages.
2) **Level 2: Behavior Contracts**. They define the preconditions and post-conditions of components.

Math

```
This is the equation for the CAN timing analysis:
\begin{equation}
        Q_i=B_i+\sum_{\forall j, P_j<P_i}\left\lceil\dfrac{Q_i+\tau}{T_j}\right\rceil C_j,
\end{equation}
where the detailed definitions are provided in Question~\ref{sec:can}. If we replace $B_i$ by …
```

This is the equation for the CAN timing analysis:

$$Q_i = B_i + \sum_{\forall j, P_j < P_i} \left\lceil \frac{Q_i + \tau}{T_j} \right\rceil C_j, \tag{1}$$

where the detailed definitions are provided in Question 4. If we replace B_i by "the largest transmis-

Figure and Table

```
\begin{figure}
\begin{center}
\includegraphics[width=7.5cm]{figure/architectures}
\caption{(a) …}
\label{fig:architectures}
\end{center}
\end{figure}
```

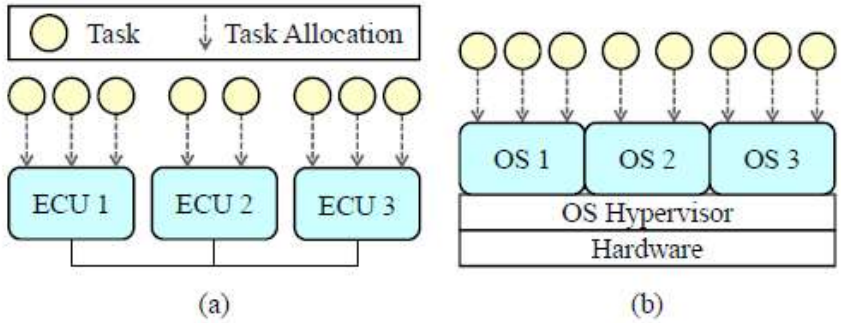


Fig. 2. (a) A traditional architecture which statically allocates tasks are difficult to support plug-and-play systems. (b) An architecture supported by an OS hypervisor is more flexible and suitable for plug-and-play systems.

```
\begin{tabular}{|c||c||c|c|c|c|c|c|c|c|} \hline
    Iteration   & LHS ($Q_1$) & $B_1$ & $j$ & $Q_1+\tau$ & $T_j$ & $\left\lceil\dfrac{Q_1+\tau}{T_j}\right\rceil$ & $C_j$ & RHS & Stop? \\\hline\hline
    1           & 30          & 30    & 0   & 30.1       & 40    & 1                                              & 10    & 40  & No    \\\hline
    2           & 40          & 30    & 0   & 40.1       & 40    & 2                                              & 10    & 50  & No    \\\hline
    3           & 50          & 30    & 0   & 50.1       & 40    & 2                                              & 10    & 50  & Yes   \\\hline
\end{tabular}
```

Iteration	LHS (Q_1)	B_1	j	$Q_1+\tau$	T_j	$\left\lceil\frac{Q_1+\tau}{T_j}\right\rceil$	C_j	RHS	Stop?
1	30	30	0	30.1	40	1	10	40	No
2	40	30	0	40.1	40	2	10	50	No
3	50	30	0	50.1	40	2	10	50	Yes

Where to Draw a Figure?

- A graph of the "vector type" is necessary
  - Do not use a graph of the "pixel type"
- Why is a .ppt file recommended?
  - It is a graph of the "vector type"
  - It can be used for a presentation directly
- Take care of the size of fonts and color!

Reference

- Option 1: list references directly in a .tex file
  - Naming rule of references
    - Option 1: use the last name of the first author
    - Option 2: use the appearance ordering in the paper
- Option 2: use a .bbl file
  - "bibtex filename" after "pdflatex filename"
  - Personal feeling
    - It is good for a long publication or a series of publications
    - The format can still be messy
- Use "\cite" to cite references

Something Detailed

- Linking (~)
  - Figure~\ref{fig:mst}
- Quotation Marks
  - Correct: `` ''
  - Wrong: " "
- Dashes (-, --, ---)
  - World-famous
  - Pages 21--50
  - You are a student of NTU --- the best university in Taiwan.
- Comments (%)
- In math mode
  - \min, \max, \left\{ … \right\}
  - \cdots vs. \ldots

Something Recommended

- Labeling style
  - \label{fig:xxx}, \label{tbl:xxx} or \label{tab:xxx}, \label{eqn:xxx}, \label{sec:xxx}, \label{subsec:xxx}
  - \label{ref:xxx}
- Table

```
\begin{tabular}{|c||c||c|c|c|c|c|c|c|c|} \hline
    Iteration   & LHS ($Q_1$) & $B_1$ & $j$ & $Q_1+\tau$ & $T_j$ & $\left\lceil\dfrac{Q_1+\tau}{T_j}\right\rceil$ & $C_j$ & RHS & Stop? \\\hline\hline
    1           & 30          & 30    & 0   & 30.1       & 40    & 1                                              & 10    & 40  & No    \\\hline
    2           & 40          & 30    & 0   & 40.1       & 40    & 2                                              & 10    & 50  & No    \\\hline
    3           & 50          & 30    & 0   & 50.1       & 40    & 2                                              & 10    & 50  & Yes   \\\hline
\end{tabular}
```

- Math notation
  - Example of categories
    - Set: upper case of Greek alphabet
    - Element: lower case of Greek alphabet
    - Constant: upper case of English alphabet
    - Variable: lower case of English alphabet