Computer Programming

Graphical User Interface II

Swing

Willy Picard
Department of Information Technology
The Poznan University of Economics
<picard@kti.ae.poznan.pl>

Agenda

- Lecture Goal(s)
- AWT vs Swing
- Look & Feel
- MVC
- Conclusion

Lecture Goal(s)

Lectures Overview

Java

- ▶ 8: Summarizing Example
- ▶ 9: Standard library
- ▶ 10: GUI – AWT
- ▶ 11: GUI – Swing
- ▶ 12: IO programming
- ▶ 13: Network programming
- ▶ 14: Java archives and JavaBeans
- ▶ 15: Conclusions

LECTURE GOALS

Today's Goal

To provide programming knowledge about the building of GUIs with Swing

AWT vs Swing

Swing

- Building GUIs
- Extends AWT
    - New containers
    - New components
    - New layout manager
    - New events and listeners
- First appearance at JavaOne (1997)
- Integrated to Java in Java2

Swing vs AWT

- ## Packages
  - `java.awt → javax.swing`

- ## New classes (with 'J')
  - `java.awt.Frame → javax.swing.JFrame`
  - `java.awt.Panel → javax.swing.JPanel`
  - `java.awt.Button → javax.swing.JButton`

- ## Name changes
  - `java.awt.Choice → javax.swing.JComboBox`

Important Changes

- ## Closing a window

```
JFrame frame = new JFrame("MyFrame");
frame.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
```

- ## Adding components to windows

```
JLabel label = new JLabel("Hello World");
frame.getContentPane().setLayout(new BorderLayout());
frame.getContentPane().add(label, BorderLayout.CENTER);
```

A
W
T

V
S

S
W
I
N
G

Swing Example

Swing Set Demo

AWT VS SWING

Pluggable
Look & Feel

PLAF Example

Swing Set Demo

Setting PLAF

▶ **The** `javax.swing.UIManager` **class**

▶ **Setting the PLAF**

    `UIManager.setLookAndFeel(plafClassName);`

▶ **Getting PLAFs**

    ▶ `getCrossPlatformLookAndFeelClassName();`

    ▶ `GetSystemLookAndFeelClassName();`

▶ **Updating the GUI**

    ▶ `UIManager.setLookAndFeel(lnfName);`
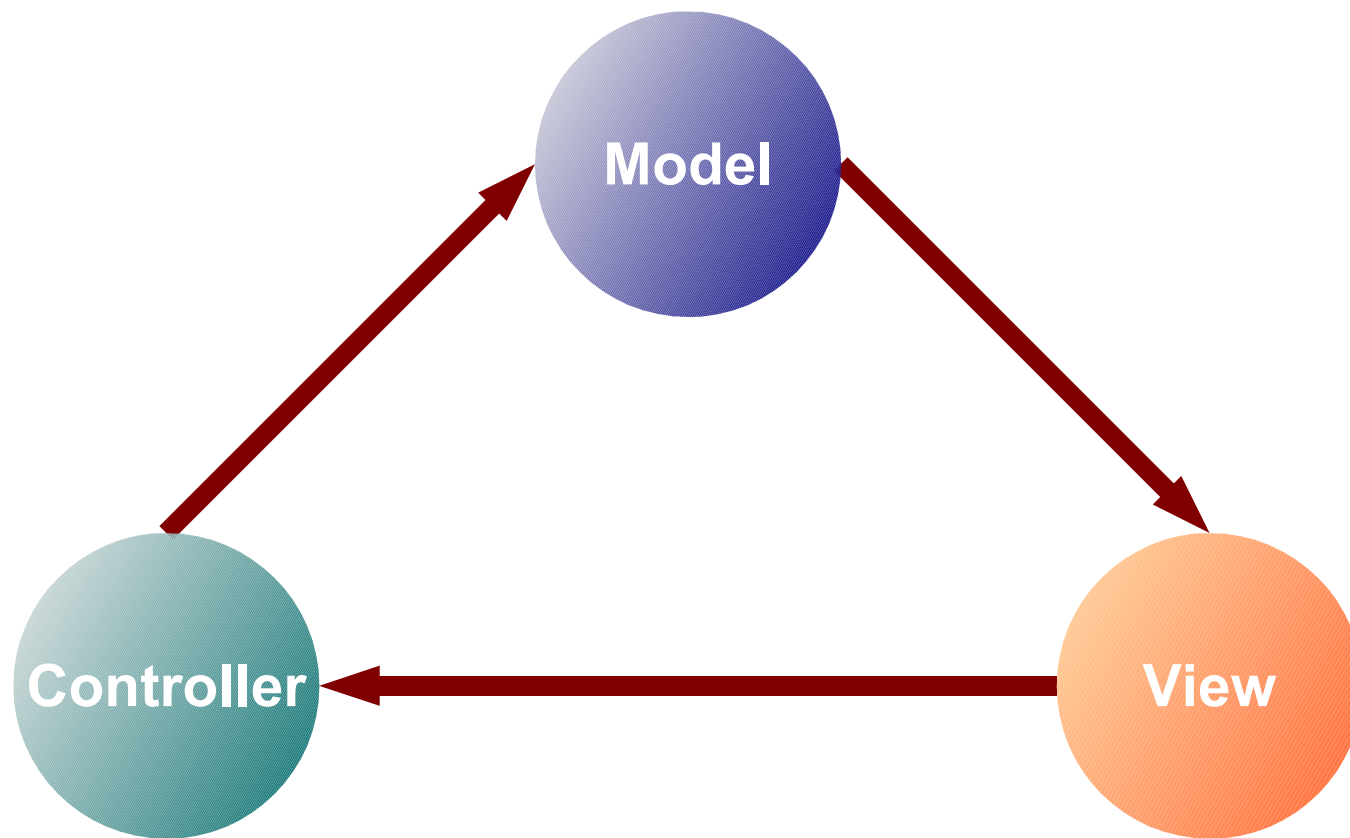
    ▶ `SwingUtilities.updateComponentTreeUI(frame);`
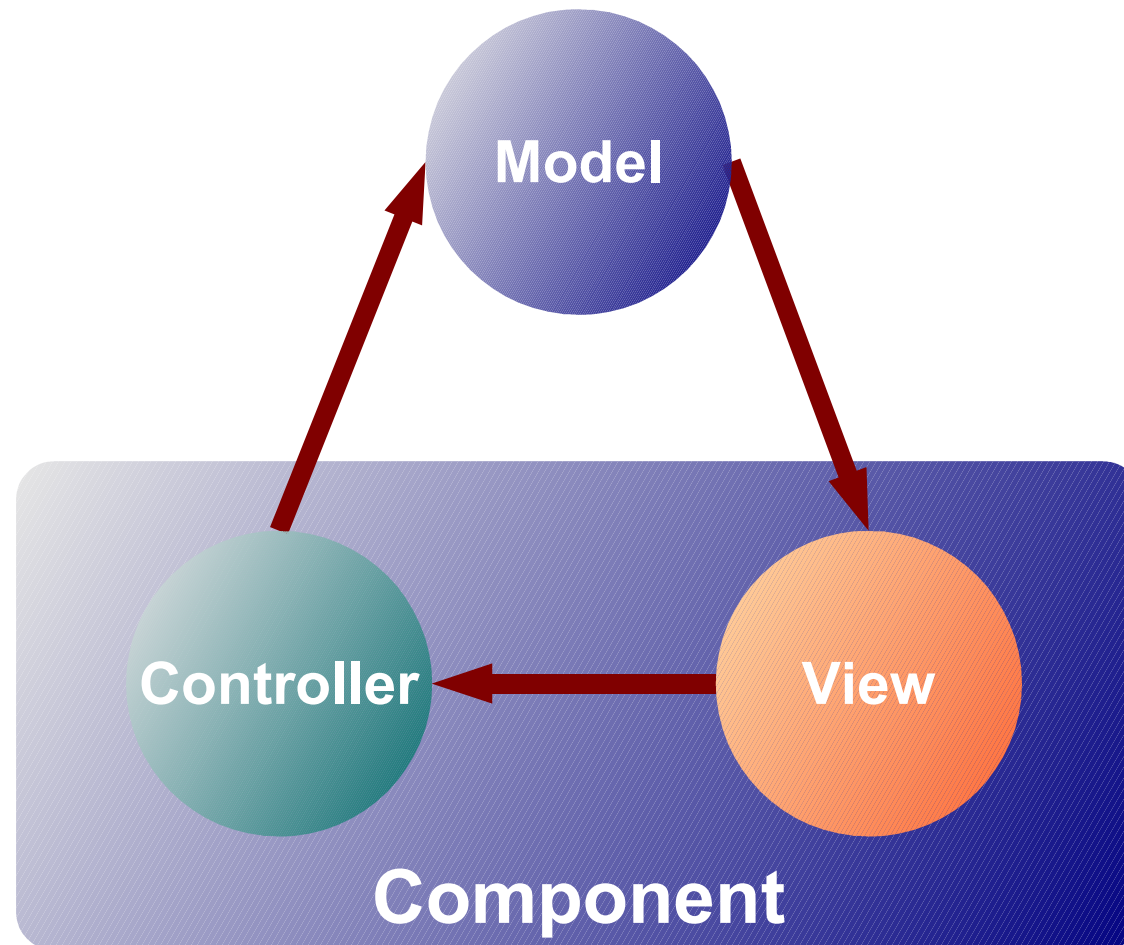
    ▶ `frame.pack();`
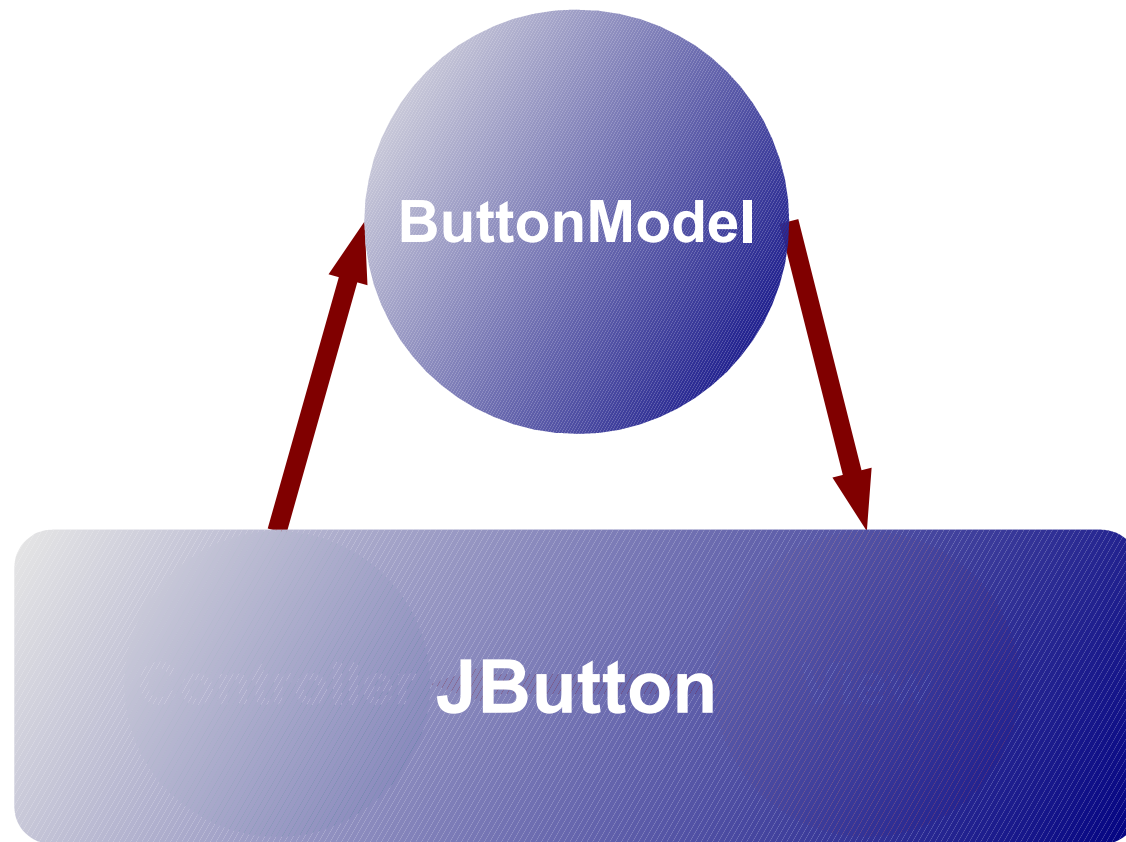
MVC
Model-View-Controller

The MVC Model

The MVC Model

- **The Model**
  - Data and logic processing
  - Notifies view of changes
- **The View**
  - Model display
  - Notifies controller of user interaction
- **The controller**
  - User interaction processing
  - Notifies model of action to be taken
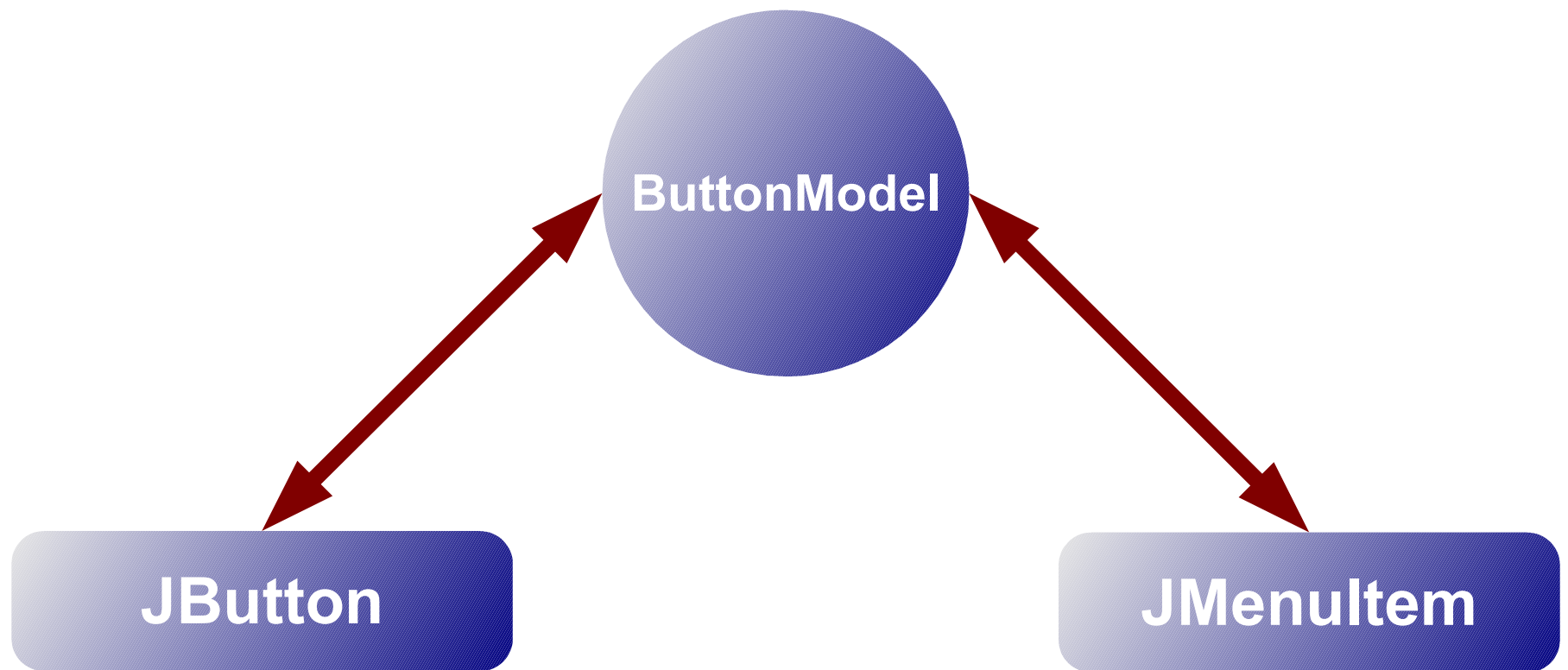
MVC

The MVC Model in Swing

Example

ButtonModel

JButton

1 Model, Many Components

ButtonModel

JButton

JMenuItem

MVC

Examples

Example

Age Calculator Example

Example

Basket Manager Example

Conclusion

GUI and Swing

- **Swing is powerful!**

- **Use the API and the Java tutorial**

- **Separate GUI and logic**

  - Build models

  - Build GUI on top of models

See you next week