Team Practical Course on AR and VR Research

02 – Vivian Framework

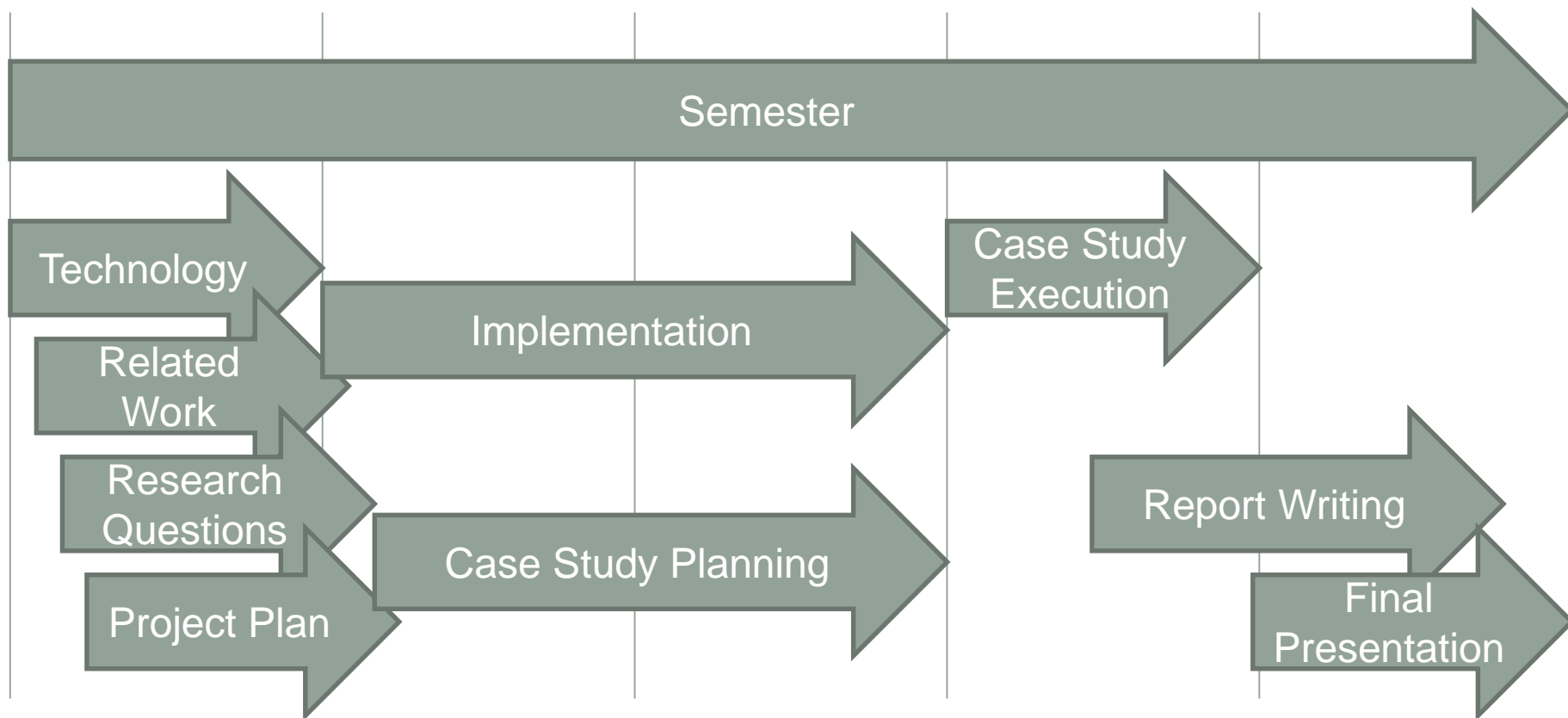Patrick Harms

Tel: 0551-39-172036

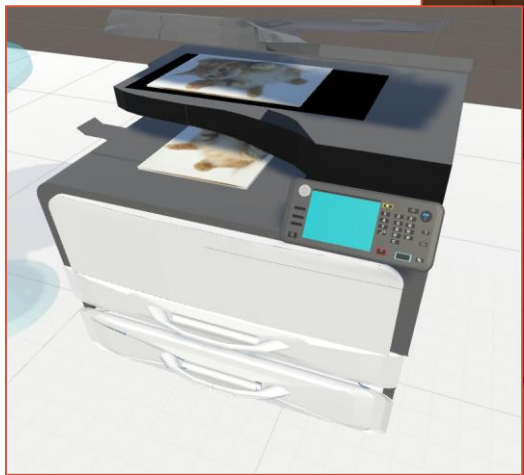patrick.harms@informatik.uni-goettingen.de

Basic Course Structure

My Research Area

- Usability evaluation of technical device prototypes

Vivian Framework – Goal

- Evaluate usability of virtual prototypes

- Evaluate in 2D using any computer

- Evaluate in AR
  - Present: mobile AR
  - Future: AR with stereoscopic glasses

- Evaluate in VR
  - Present: virtual laser pointer, hand tracking/virtual hands
  - Future: Gaze pointer, gloves, other VR headsets, …

Vivian Framework – Approach

- Model virtual prototype

- Model statemachine(s) to define prototypes functionality

- Evaluate and record interaction
 - both AR and VR

- Analyse results
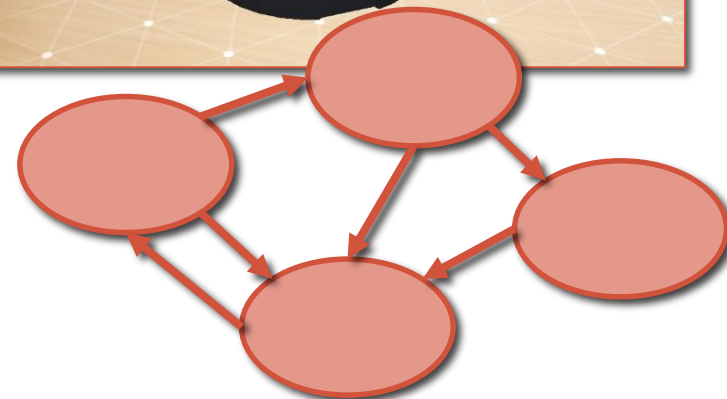
# Vivian Framework – Components

- ## Vivian Core
  - Main framework elements

- ## Vivian Example Prototypes
  - Prototypes used for current testing (nonsense device, coffee machine)

- ## Vivian XX Interaction
  - One for each (mouse, ARCore, Open VR)

- ## …

Vivian Framework – Unity Usage

- Relevant Components as ZIP file in StudIP
  - Unzip

- Every component is a Unity package
  - Loaded as local package using the Unity Package Manager

- To start up create a new 3D project and load the following packages
  - VivianCore
  - VivianExamplePrototypes
  - VivianMouseInteraction
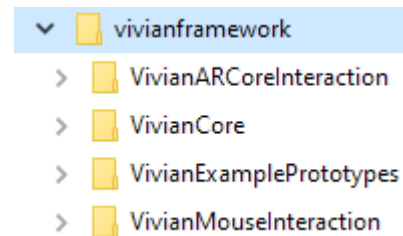
# Vivian Framework – Unity Usage, Load Package
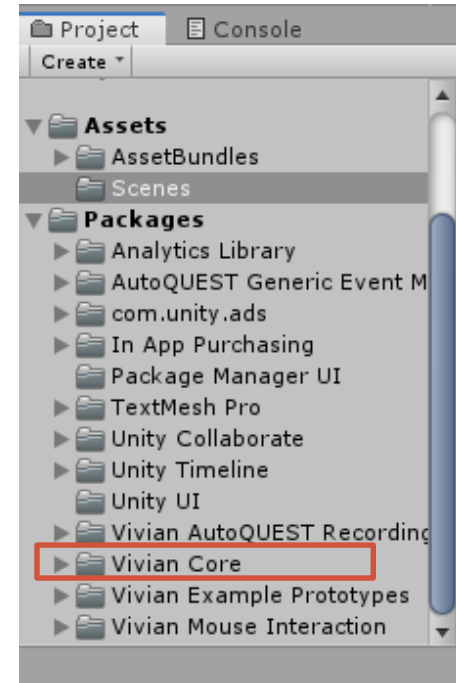
Vivian Framework – Unity Usage

- Create new Scene

- Add Vivian Framework Prefab
  - Package/Vivian Core/Runtime/Prefabs/VivianFramework

- Add Mouse Interaction Prefab
  - Package/Vivian Mouse Interaction/Runtime/Prefabs/MouseInteraction

- Create Prototype Asset Bundle
  - In the menu click Assets/Build Vivian Prototype Bundles
  - Refresh Assets

Vivian Framework – Unity Usage

- Configure Vivian Framework
  - In scene click the "VivianFramework" object
  - In the "Virtual Prototype" component set the "Bundle URL" to
    - AssetBundles/StandaloneWindows64/coffeemachine
  - In the "Virtual Prototype" component set the "Prototype Prefab Name" to
    - CoffeeMachine

- Run the scene

- Adapt camera and light so that you see the prototype well

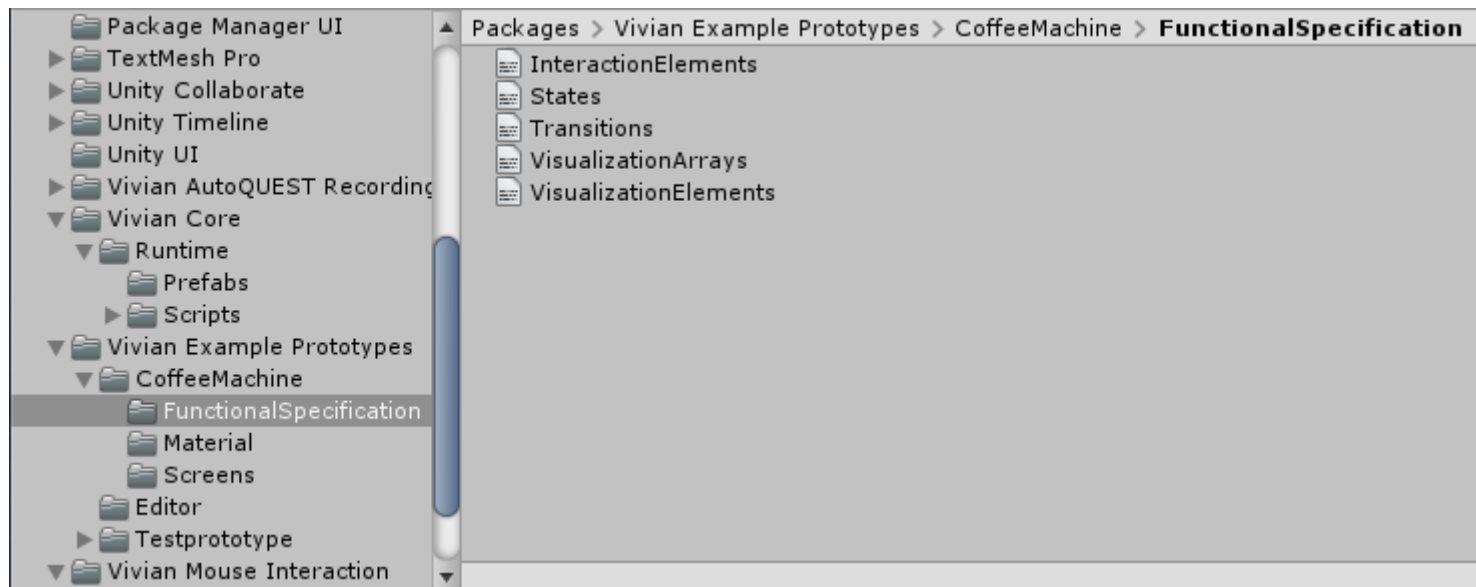# Vivian Framework – Prototype configuration
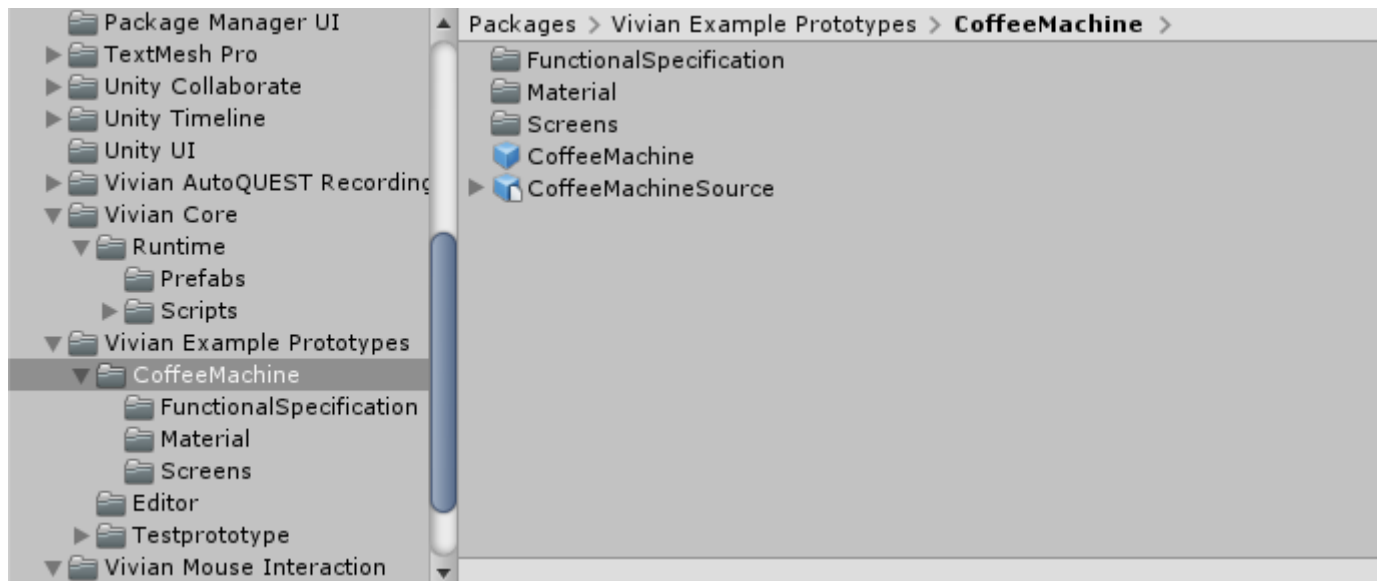
Vivian Framework – Prototype configuration

- Model Prefab
  - See Packages/Vivian Example Prototypes/CoffeeMachine
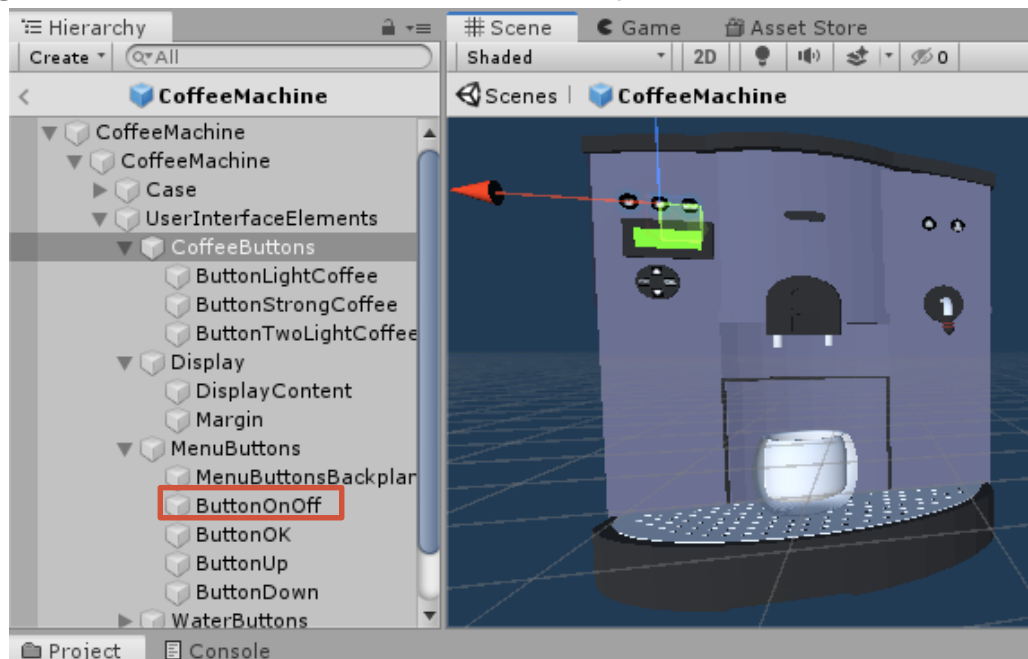
Vivian Framework – Prototype configuration

- Functional Specification

Vivian Framework – Prototype configuration
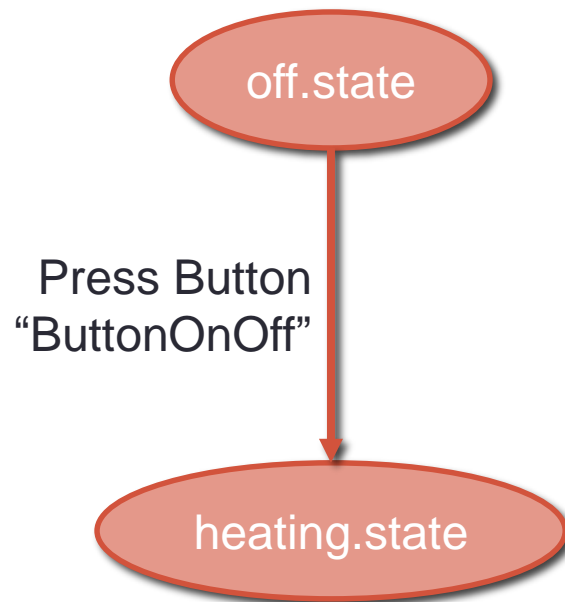
- Example
  - In InteractionElements.json:
    -
      ```
      {
          "Type": "Button",
          "Name": "ButtonOnOff"
      },
      ```

  - In States.json:
    - off.state and heating.state

  - In Transitions.json:
    -
      ```
      {
          "SourceState": "off.state",
          "InteractionElement": "ButtonOnOff",
          "Event": 0,
          "DestinationState": "heating.state"
      },
      ```

off.state

Press Button
"ButtonOnOff"

heating.state

Tasks for upcoming week

- Setup the Vivian Framework

- Analyze the existing prototype(s)
  - Including the state machine
  - Try to understand visualizations

- Start configuring your own virtual prototypes
  - Use your model
  - Define some states and transitions using Vivian notation

Presentations next week

- State of your virtual prototype using Vivian Framework

- Problems with Vivian Framework

Questions???