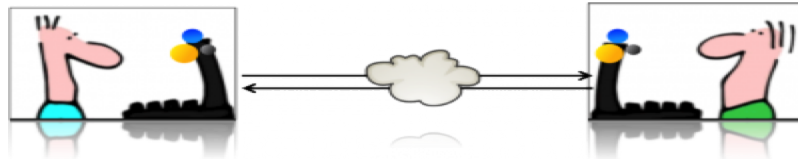
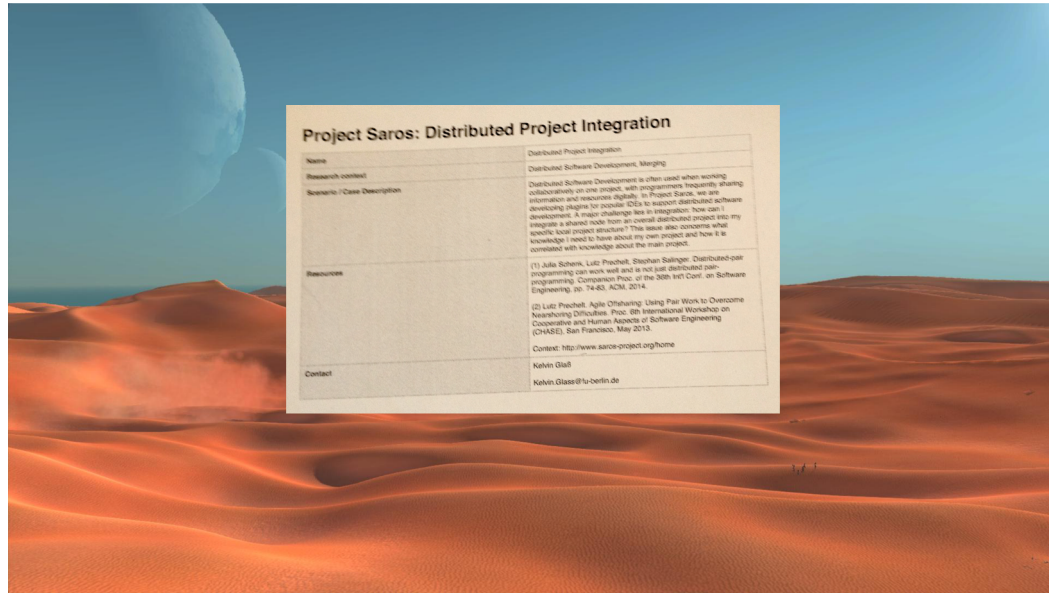


# Saros: Distributed Project Integration

Benjamin Sypianski, Cedric Laier, Mahmoud Kozae



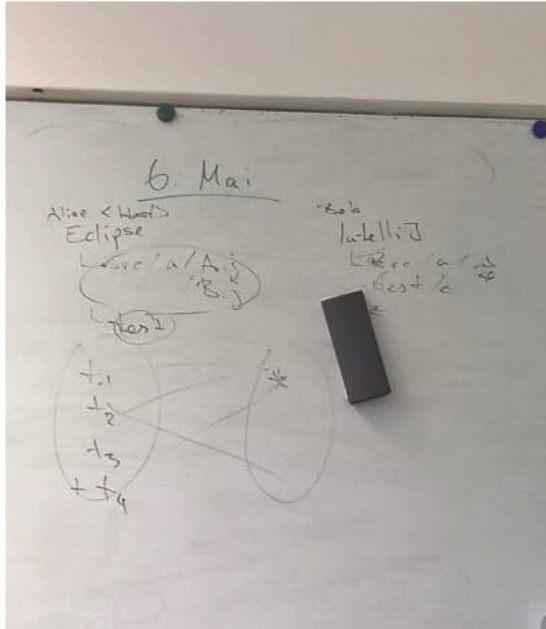
# Knowledge at the beginning



The image shows a document titled "Project Saros: Distributed Project Integration" overlaid on a background of a desert landscape with orange sand dunes and a large blue planet in the sky. The document is structured as follows:

Project Saros: Distributed Project Integration	
Name	Distributed Project Integration
Research context	Distributed Software Development, Merging
Scenario / Case Description	Distributed Software Development is often used when working collaboratively on one project, with programmers frequently sharing information and resources digitally. In Project Saros, we are developing plugins for popular IDEs to support distributed software development. A major challenge lies in integration: how can I integrate a shared node from an overall distributed project into my specific local project structure? The saros also concerns what knowledge I need to have about my own project and how it is correlated with knowledge about the main project.
Resources	(1) Mike Schenk, Lutz Prechelt, Stephan Salinger. Distributed-pair programming can work well and is not just distributed pair programming. Companion Proc. of the 30th Int. Conf. on Software Engineering, pp. 74-83, ACM, 2014. (2) Lutz Prechelt. Agile Onboarding: Using Pair Work to Overcome Onboarding Difficulties. Proc. 6th International Workshop on Cooperative and Human Aspects of Software Engineering (CHASE), San Francisco, May 2013. Context: <a href="http://www.saros-project.org/home">http://www.saros-project.org/home</a>
Contact	Kevin Glasl Kevin.Glasl@fu-berlin.de

# General Idea

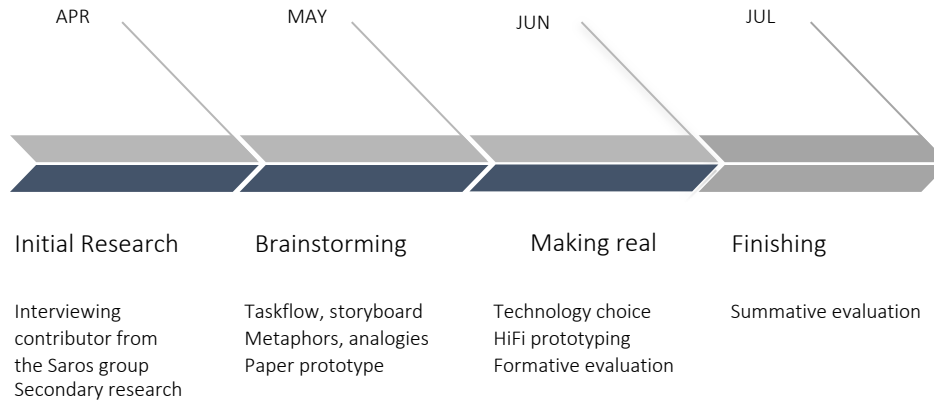


Focus on the project's structure

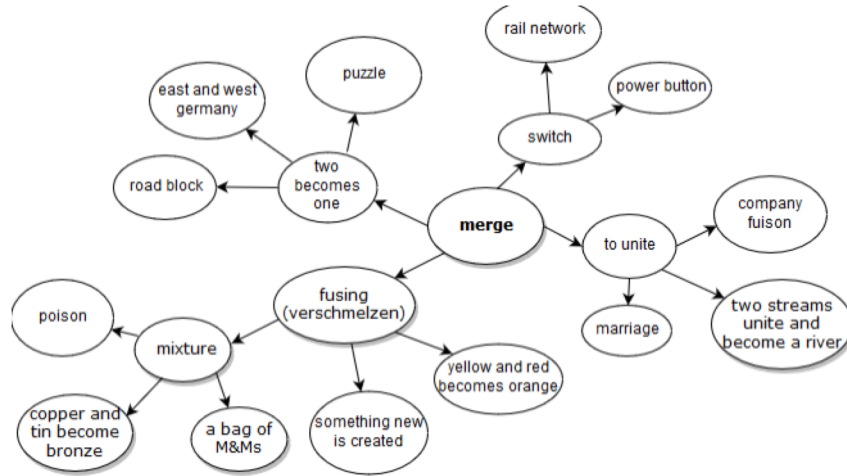
Important questions:

- How to integrate files between participants of a Saros session?
- How to visualize the whole process to the user?

# Project Timeline

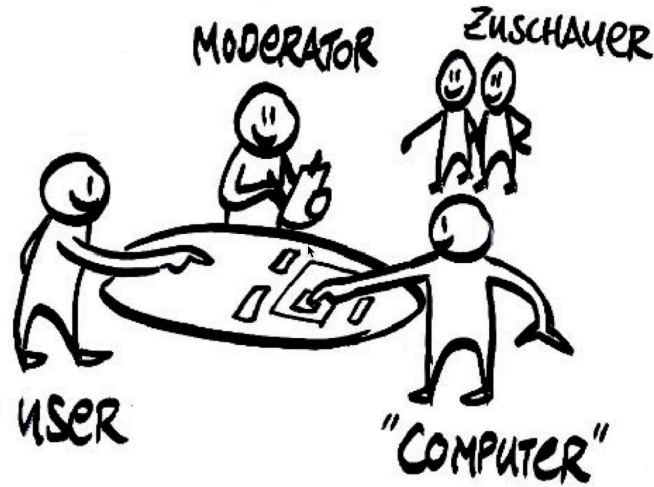


# Creative Part



# Paper Prototype & First Iterations

## Paper Prototypes



# Biggest Challenges

- Find a way to visually compare projects
- Identify possible file & folder states
- Find the the “right” icons and data visualisation to transfer this knowledge to the user
- Come up with a task flow to resolve conflicts

Possible Folder States	File States in Folder	File Color	
Contains older files	Older File	Grey	
Contains right change files	Right change file	Purple	
Contains left change files	Left change file	Cyan	
Contains mergeable files	Mergeable file	Orange	
Contains conflict files	Conflict file	Red	
Contains right change and older files	Right change & Old file	Purple	
Contains left change and older files	Left change & Old file	Cyan / Grey	
Contains left change and right change files	Left change & Right change file	Cyan / Grey	
Contains mergeable and older files	Mergeable file & Older file	Orange / Grey	
Contains mergeable and right change files	Mergeable file & Right change file	Orange / Purple	
Contains mergeable and left change files	Mergeable file & Left change file	Orange / Cyan	
Contains conflict and older files	Conflict file & Older file	Red / Grey	
Contains conflict and right change files	Conflict file & Right change file	Red / Purple	
Contains conflict and left change files	Conflict file & Left change file	Red / Cyan	
Contains conflict and mergeable files	Conflict file & Mergable File	Red / Orange	
Merge Actions	Icon	Merge Actions	Icon
<i>Regardless of merge target:</i>		<i>When mergin to Target:</i>	
No action required	✓	Copy to right	→
Merge automatic	↔	Delete right	x
manual merge required	!!		
<i>When mergin to Source:</i>		<i>When mergin to New:</i>	
Copy to left	←	Take Source	↖
Delete left	x	Take Target	✓



Hi-Fi Prototype

LIVE DEMO

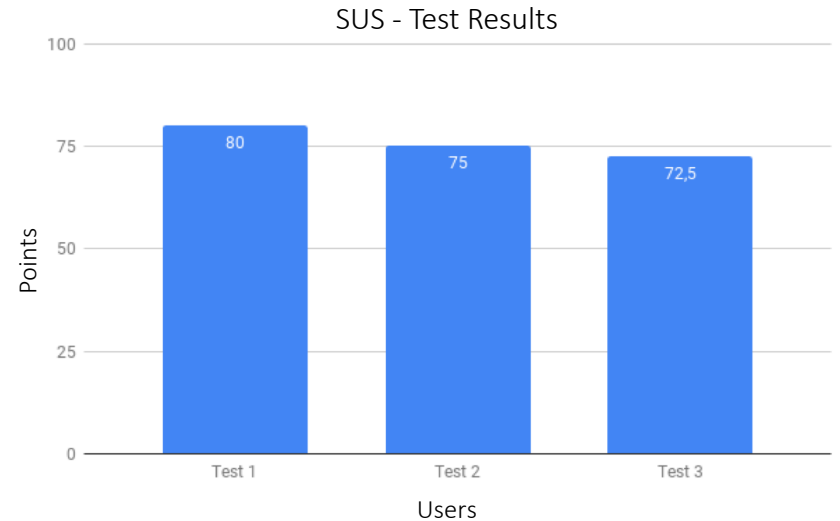
also hosted on a S3 Bucket here



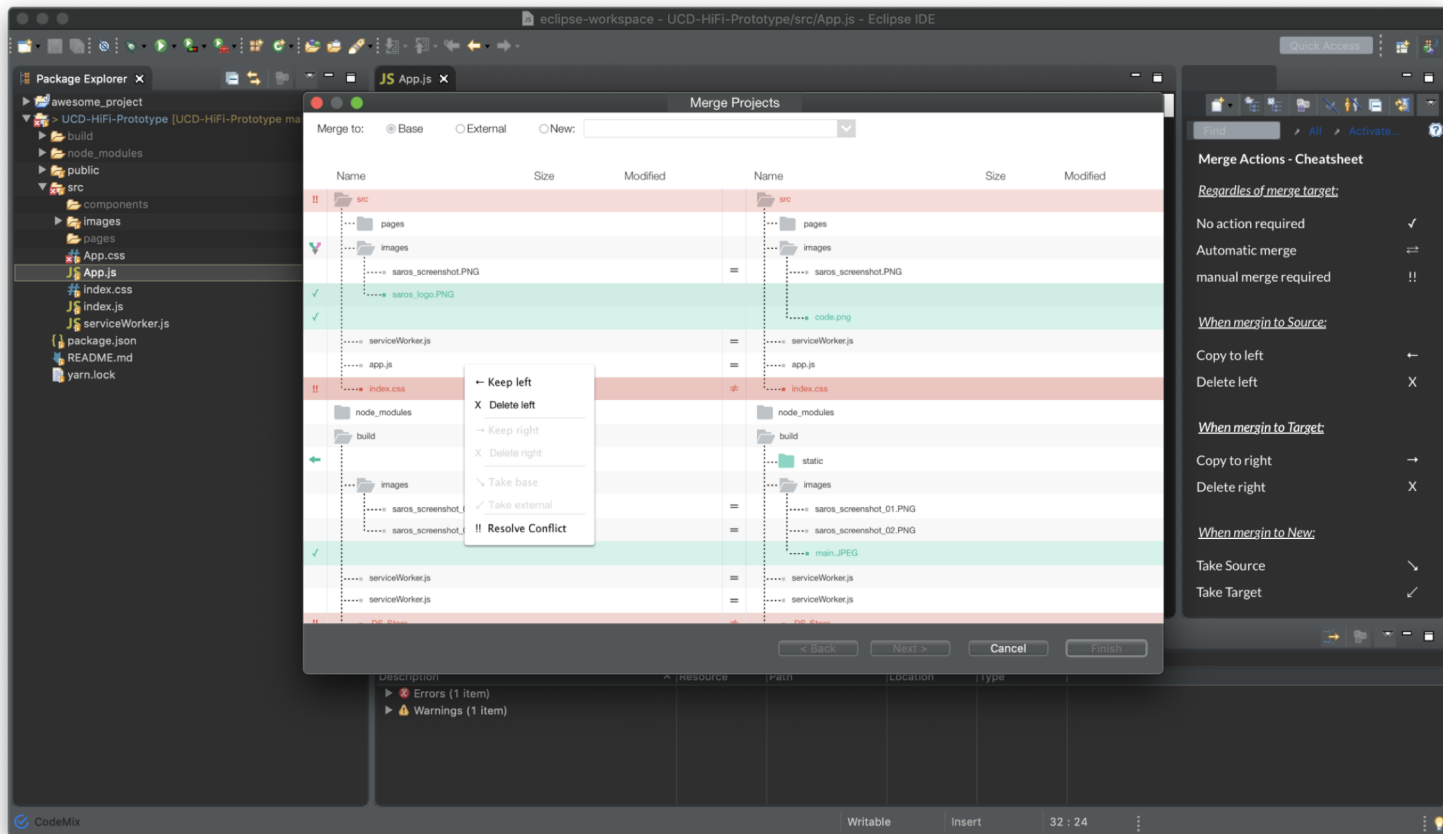
# Testing the Hi-Fi Prototype

## System Usability Scale (SUS)

- We wanted to get an high level overview of the view of usability for the user
- Should allow us to quickly compare the effect of adjustments
- Tested professional Software-Engineers
- Overall average Score of 75,6 Points (> 71,4 = Good ; > 85,5 = Excellent)



# Outlook (Eclipse)



# Outlook (VS Code)

The screenshot displays the VS Code interface with a 'Merge Projects' dialog box. The dialog compares two file trees side-by-side. A context menu is open over the 'index.css' file in the left tree, showing options like 'Keep left', 'Delete left', 'Keep right', 'Delete right', 'Take base', 'Take external', and 'Resolve Conflict'. The background shows the Explorer sidebar with a project structure and a code editor with 'index.js' content.

**Merge Projects**

Merge to:  Base  External  New:

Name	Size	Modified	Name	Size	Modified
src			src		
pages			pages		
images			images		
saros_screenshot.PNG			saros_screenshot.PNG		
saros_logo.PNG			code.png		
serviceWorker.js			serviceWorker.js		
app.js			app.js		
index.css			index.css		
node_modules			node_modules		
build			build		
images			static		
saros_screenshot_01.PNG			saros_screenshot_01.PNG		
saros_screenshot_02.PNG			saros_screenshot_02.PNG		
			main.JPEG		

Context Menu for 'index.css':

- ← Keep left
- X Delete left
- Keep right
- X Delete right
- ↶ Take base
- ✓ Take external
- !! Resolve Conflict

Buttons: Back, Next, Finish, Cancel

**Merge Actions - Cheatsheet**

- Regardless of merge target:
- No action required ✓
- Automatic merge ⇄
- manual merge required !!
- When merging to Source:
- Copy to left ←
- Delete left X
- When merging to Target:
- Copy to right →
- Delete right X
- When merging to New:
- Take Source ✓
- Take Target ✓

# Outlook

What's missing:

- Add more Scenarios: Merge base into external project & Merge base project + external project into new project
- Extend Prototype and have more Test-Iterations
- Finetune Icon mapping
- Add color-codes for folder/file states
- Extend the prototype by a "Resolve Conflicts" View

# Thank you!

All artefacts can be found here:

Images, Sheets, Assignments, Tests etc. : <https://drive.google.com/drive/u/0/folders/1cKRxE9S8sb23oDIQd008UV9nmzOWXYwX>

Web Hi-Fi Prototype Code: <https://github.com/Rintel/UCD-HiFi-Prototype>

MacOS Hi-Fi Prototype Code: <https://github.com/nepysb/SarosUCDMacOSPrototype>