Lillian

A beautiful, cross-platform file manager.

Recap of 1st iteration

Initial vision, requirements and plans for 2nd iteration

Vision

- Clean, intuitive user interface
  - Drag and drop files between multiple windows
  - Keyboard shortcuts
- Support for multiple local and remote file systems
  - Files stored on disks accessible via system interface
  - SSH file systems
  - Google Drive, One Drive and other cloud storage systems
- Stability and speed
- Client for multiple platforms

A look back at 1st iteration

- Goals
  - Create a proof of concept that can serve as foundation for further iterations
  - Design and implement a user interface that is intuitive and can be used for multiple platforms
- Requirements
  - Displays contents of a folder visible via native OS interface
  - Users can navigate between folders
  - Works out-of-the-box on Ubuntu and Windows
  - Always quick and responsive

All requirements were met.

Initial plans for 2nd iteration

- Initial plans included:
  - Implement file opening, moving and copying
  - Allow for drag-and-drop operations between application windows
  - Integrate application with at least one remote drive
- Initial plans were scaled down, to accommodate:
  - Implementation of a fast (on-the-fly streaming) transfer from / to a remote drive with specific API
  - Fixing bugs from 1st iteration

2nd iteration

Plans, challenges, solutions and final result

Final plans for 2nd iteration

- Functionality
  - Ability to navigate through files in a remote location (specific API and responsiveness as a requirement)
  - Add aliases for most important locations (local and remote)
- User Interface
  - Display loading and error information on status bar
  - Add settings window for managing locations and aliases
  - Minor changes in shapes and sizes of UI components
- Bug fixes

Adding external location

- Challenge: loading large folders
  - Request cannot be blocking
  - Users should see files as soon as possible
- Solution
  - Read HTTP response body chunk-by-chunk
  - Parse raw response text to JSON objects on the fly
  - Stream parsed JSON objects from main thread to UI thread in batches of 10 files / folders
- Useful tools
  - OBOE – library for parsing JSON on the fly

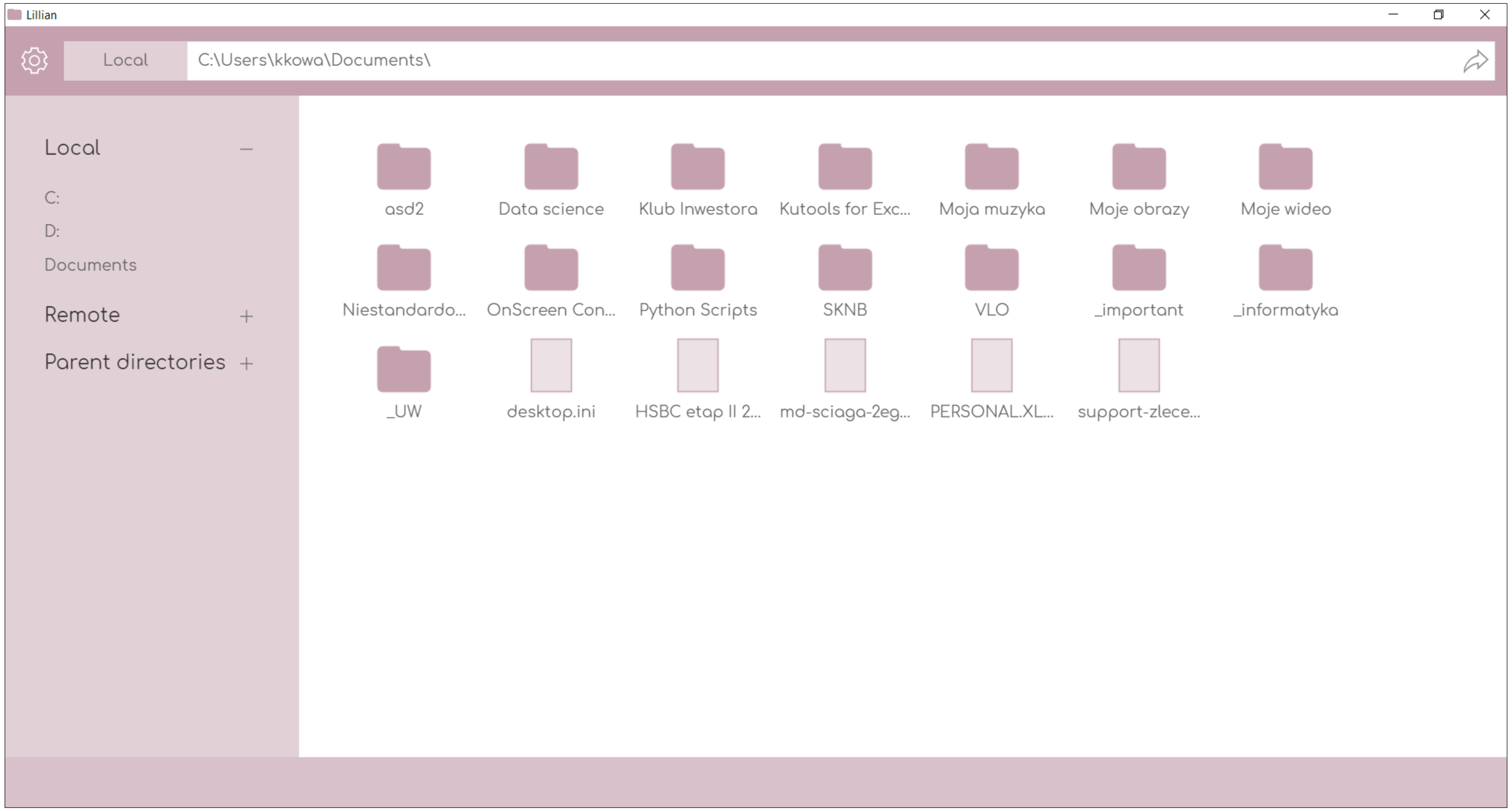
Parsing JSON stream with OBOE

```
let arr = [];  // hold parsed CHUNKS (valid JSON objects)
activeStream = oboe({
    method: 'POST',
    url: locData.url + `?l=${locData.login}&p=${locData.pass}&q=${rMsg.path}`,
    agent: false,
    json: locData
}).node('!.*', (data) => {
    arr.push(data);
    if (arr.length === CHUNK_SIZE) {  // after pasing CHUNK_SIZE objects, send them to renderer
        const array_copy = arr.slice();
        arr = [];
        const parsedObjects = parseRemoteJsonChunk(array_copy, rMsg);
        addExtraAndSend(current_session_id, event, parsedObjects);
    }
}).fail((error) => {
    if (error.jsonBody) {
        const parsedObjects = parseRemoteJsonChunk(error.jsonBody, rMsg);
        addExtraAndSend(current_session_id, event, parsedObjects);
    } else {
        sendError(event);
    }
}).done((response) => {
    if (arr.length !== 0) {
        addExtraAndSend(current_session_id, event, parseRemoteJsonChunk(arr, rMsg));
    }
    event.sender.send('endOfStream');
});
```

Designing communication

- Challenge: design maintainable IPC for new features
  - IPC message schema has to be understood by developers working on both UI (renderer) and main threads
  - Communication schema should not constrain new features
- Solution
  - All major data processing and transformations performed on main thread (except wrapping data with HTML)
  - REST-inspired message naming: addDisc, updateDisc, deleteDisc
  - Keeping all messages and their content in standardized format (JSON objects, paths in POSIX strings, etc.)
  - Detailed and updated readme with message schemas: never committing a change in IPC without changing docs

Refined user interface



Demo

Summary

State of development, lessons learned and outlook

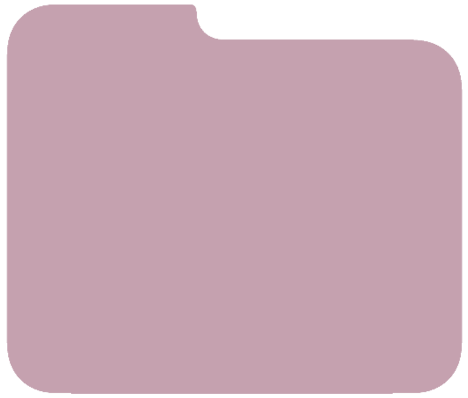
Summary & outlook

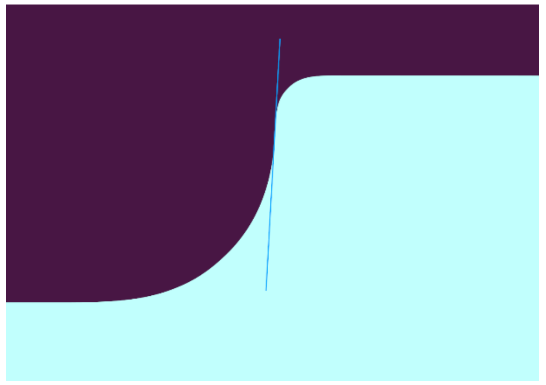
- Completed all final plans for 2nd iteration
- Fixed all known bugs from 1st iteration
- Future development opportunities:
  - Implement file opening, moving and copying
  - Allow for drag-and-drop operations between application windows
  - Add OSX support
  - Integrate application with more remote drives

Efficient native app development

- Using electron.js allowed us to develop a native windows and linux app very efficiently
- Stats until now (2nd iteration demo):
  - 90 commits by 4 developers
  - 1454 lines of code (1078 excluding tests and templates)
- Almost platform-independent:
  - Only ~20 lines of platform-dependent code
  - In theory deployable to OSX without additional overhead

Light colors and smooth curves





Using proven methods for natural, non-invasive design

Our Team

Tomasz Miśków

UI design, general research
Development:
Front-end: HTML and CSS,
Handling UI and IPC events

Krzysztof Olejnik

Development:
File system support,
IPC design and documentation,
Remote API communication

Krzysztof Kowalczyk

Presentation, testing
and code review
Development:
Remote API communication

Maciej Twardowski

Development;
File system support,
User data storage,
Handling IPC events

Thanks!

Content sources:

iPhone X image:
https://www.apple.com/pl/iphone-x/

iPhone X notch image and article:
https://medium.com/tall-west/no-cutting-corners-on-the-iphone-x-97a9413b94e

Source code and related documentation, including license information (will be available publicly 10 days after the presentation):
https://github.com/kowaalczyk/lillian-file-manager