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Bachelor's Thesis
Development of a Networked Pixel Art Drawing Application

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Pixel art sprites for games are usually created using drawing tablets, as drawing on a tablet is much easier than with a mouse on a computer. After the drawing is finished, the created sprite has to be saved to a file by the drawing software. Then it needs to be transferred to the computer where the sprites are then used. The most used format for pixel art sprites in game engines are png files. Unfortunately, some drawing tools are not able to export png files. Hence, the file needs to be converted to png in such a case.

Typically, a sprite is not finished after the initial drawing, but needs to be refined multiple times to fit the style of the overall game and polish it. Therefore, creating a useable pixel art sprite is an iterative process where the pipeline from drawing in the tablet to making it useable by a game engine on a computer has to be repeated multiple times. Making this process tedious and time-consuming.

This project may help with the problem mentioned above by implementing a drawing application with the focus on "ease of use" and "convenience". The idea is that this new application is executed on the computer on which the sprites are being used and on a device for drawing simultaneously. Those two devices then build up a connection to each other over the home network, to stream from the tablet to the computer, such that the drawn pixel art sprite can be directly seen on the computer. Furthermore, the pixel art sprite can be saved to a png file with the click of a button.
In addition to all the standard functions a pixel art drawing application has to offer, a shading function will also be implemented. The shading function can either be used with a masking tool or a brush. With the help of the masking tool, an area can be selected in which the color is changing incrementally darker or lighter depending on the settings. On the other side it will also be possible to shade freely with a brush. The whole implementation will be done in the game engine Godot.

Goal of this bachelor's thesis:
- Create drawing application with a graphical user interface
- Implement the standard functions of a drawing app
- Implement the shading
- Establish a communication between the devices
- Synchronize the drawing between the drawing device and the PC and save it to a file

Modalities:
The progress of the project should be discussed at least every three weeks with the advisor. A time schedule and a milestone plan must be set up within the first 3 weeks and discussed with the advisor. It should be continuously refined and monitored to make sure that the thesis will be completed in time. The final version of the thesis must be submitted not later than **31.03.2025**.