



## MILESTONE 4 EVALUATION

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### Faculty Sponsor

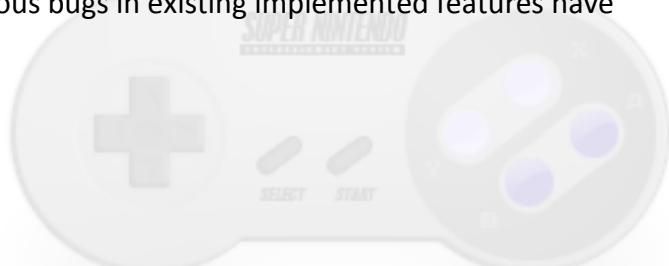
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## Current Milestone Progress

Task	Completion	Michael K.	Keith J.	Eric W.	Todo
Improve Video	100%	34%	33%	33%	
Compatibility Fixes	100%	34%	33%	33%	

## Current Task Summaries

- **Improve Video:** Several areas of video processing have been improved:
  - **Main/Sub Screens:** The main screen is the displayed graphics, while the sub screen is used in color math. Both have been implemented.
  - **Color Math:** During rendering, math operations can be performed on corresponding pixels on the main and sub screens to produce a blended or transparent effect. Basic color math has been implemented.
  - **OAM / Sprites:** OAM is an area of VRAM that stores data on individual sprites that may be positioned on the screen; it is the primary way of displaying graphics that aren't in the tile-based background system. OAM has been implemented and sprites render to the screen.
  - **Background Scrolling:** Background tilesets can be given an offset to scroll them, so that the player appears to be moving through the tileset. Backgrounds can set these scroll values and are scrolled correctly.
  - **Window Masks:** On each scanline, a left and right value can be specified to form a window of all pixels contained within those bounds. Using these bounds, a game can mask out pixels so that they are black, or prevent color math from being performed on those pixels. This can be done to pixels inside or outside the window.
- **Compatibility Fixes:** Several features of the SNES that have been blocking games running have been fixed:
  - **HiROM:** HiROM is an alternative memory layout that supports larger ROM data for games with a large amount of code or data. HiROM has been implemented and most games that use HiROM will boot without loading errors.
  - **HDMA:** DMA can be activated such that it will run once per scanline so that certain graphics features, such as masking windows, can be altered between each scanline. HDMA has been implemented and works mostly correctly.
  - **General Fixes:** Several miscellaneous bugs in existing implemented features have been fixed.



## Next Milestone Plan

- **Improve Video:** There is still a large amount of fixes and features relating to video that need to be implemented or improved:
  - **Fix Color Math:** Color math, as we have implemented it, is not perfect. We will identify edges cases that are not handled and fix them.
  - **Per-Pixel Rendering:** Currently, our rendering process works by evaluating instructions until a scanline should be rendered, and then renders the entire scanline at once. In order to work with certain features, we must rewrite the rendering process to render each pixel when it should be rendered rather than rendering per scanline.
  - **Mosaic:** The mosaic filter takes the current screen and “pixellizes” it so that it appears blocky and loses detail. This has yet to be implemented as it occurs after rendering graphics and before masking them, a process which is combined into a single step in our current rendering process.
  - **Miscellaneous Fixes:** General bugs in the graphics process need to be fixed.
- **Compatibility Fixes:** Several general features of the SNES remain unimplemented:
  - **IRQ:** The SNES has a setting that can trigger an interrupt request after a certain scanline or pixel has been rendered. Because our rendering process renders per-scanline, we cannot trip the interrupt at the correct time.
  - **Timing:** Our currently timing algorithm is not deterministic and is not accurate.
  - **Miscellaneous Fixes:** We will continue to test ROMs and fix game-breaking bugs as we encounter them.
- **Performance:** Much of our code runs slower than desired, particularly graphics rendering. We will profile and improve our code as needed in order to approach the correct speed for game execution.
- **User Experience Improvements:** The UI functionality of the applet is currently limited. We will devote effort to improve the interface and experience for the end user.
- **Showcase Poster:** We will create a showcase poster describing our project and highlighting key features and submit the poster by the deadline.

## Milestone 4 Task Matrix

Task	Michael K.	Keith J.	Eric W.
Improve Video	33%	33%	34%
Compatibility Fixes	33%	33%	34%
Performance	33%	33%	34%
User Experience Improvements	33%	33%	34%
Showcase Poster	33%	33%	34%

## Sponsor Feedback

- **Improve Video:**

- **Compatibility Fixes:**

Signature: \_\_\_\_\_ Date: \_\_\_\_\_



## **SNO: Super Nintendo Online Sponsor**

### **Milestone 3 Evaluation**

Sponsor: Please detach this page and return to Dr. Chan (HC 322).

For each team member, circle a score between 0 and 10, or write in your own score in the last box.

Michael K.	0	1	2	3	4	5	6	7	8	9	10	
Keith J.	0	1	2	3	4	5	6	7	8	9	10	
Eric W.	0	1	2	3	4	5	6	7	8	9	10	

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

