

OIIA Goose

ECE 298A Project Proposal

Joyce Mai, Victoria Mak

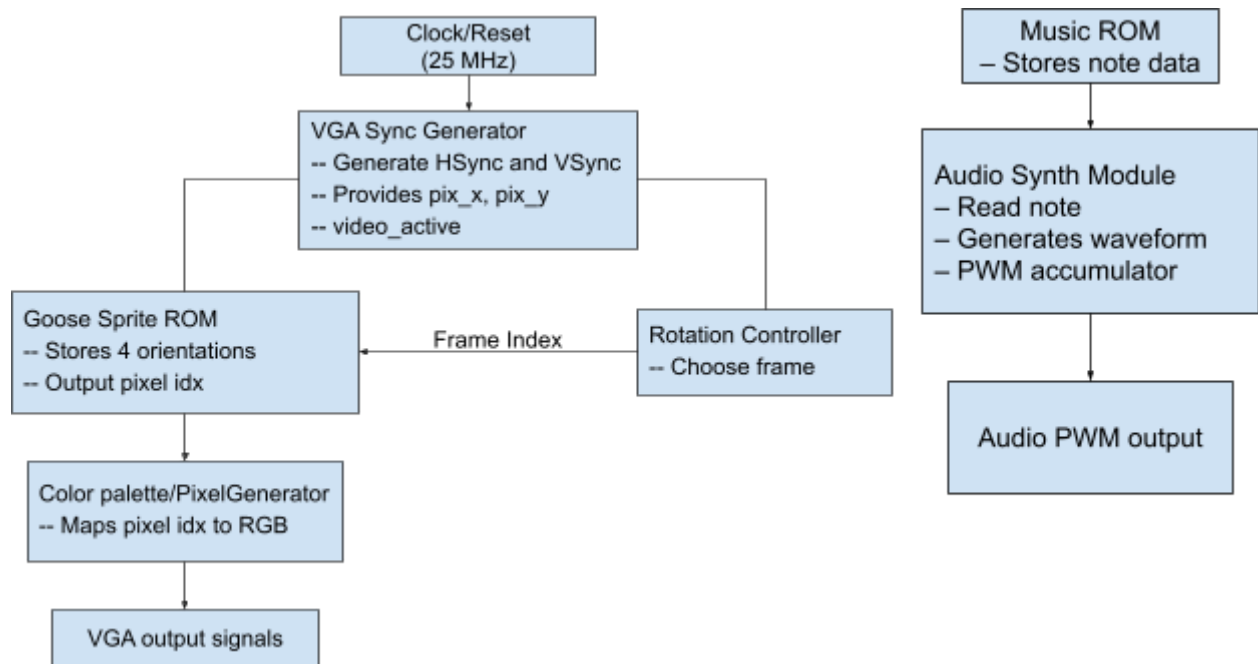


Description

OIIA Goose, inspired by the popular “[OIIA Cat](#)”, outputs a rotating goose on VGA with music. It shows a pixel Canada goose that rotates by cycling through four directions.

The display uses 2 bits per color channel (64 colors total) along with horizontal and vertical sync for VGA. We’ll also add simple OIIA-style chiptune music through an audio PWM pin, so the goose spins with sound (hopefully :p).

Block Diagram



TT I/O Assignments

Table of TT I/O Assignments (8 inputs, 8 outputs, 8 bidirectional I/O)

#	Input	Output	Bidirectional
0		R1	
1		G1	
2		B1	
3		VSync	
4		R0	
5		G0	
6		B0	
7		HSync	AudioPWM

Work Schedule

Glossary

- **VGA** (Video Graphics Array): A standard for displaying images on a monitor. It's an analog video signal where you control:
 - RGB signals
 - **HSYNC** (horizontal sync pulse: tells the monitor when a line ends)
 - **VSYNC** (vertical sync pulse: tells the monitor when a frame ends)
- **Sync Generator**
 - It counts (keeps track of) pixel positions horizontally (x) and vertically (y)
 - Produces sync pulses so the monitor knows when to start new lines/frames
 - It tells the monitor when we're in the visible area (draw pixels) and when we're in the blanking area (no pixels, just syncing)
- **Sprite**: A two-dimensional image or animation that is integrated into a larger scene, often derived from bitmap images
 - It is usually stored as a grid of pixels. Each pixel isn't full RGB, but instead a color index (a small number like 0,1,2...) that points to the color palette
- **Color Palette**: A lookup table that maps a color index → actual RGB value
- **Pixel Generator**: The logic that decides what color should appear at the current pixel
- **PWM (Pulse Width Modulation)**: The PWM is to create an analog sound from a digital timing signal. The ratio ON/(ON+OFF) in time determines the analog value of the signal
 - A note is a frequency, we can generate these notes by using a **counter**. Count clock cycles, then toggle the PWM duty cycle at the right period