Dynamic Source Filtering Sunglasses

- Dan Parker
- Torrey Atcitty
- Jason Hansen
- Dana Todd
Functional Description

The project will be comprised of a pair of glasses. The glasses will automatically detect and darken areas of intense light perceived by the user.
Components to be Designed

- LCD<->Processor interface
- Camera<->Processor interface
- Knob/Button<->Processor interface
- FPGA based microcontroller with SIMD instructions
- Embedded image processing software
- Power supply
- Physical component arrangement and fixture
Spartan 3A Starter Kit

- 50 MHz
- ISE IDE
- 372 IO pins
- 40KB SRAM
PT0353224-A102 LCD Screen

- 320 x 240
- 3.5 inch
- 24-bit color
- See-through enough
C3188A-6018 Digital Camera

- 640 x 480 (30 FPS)
- 320 x 240 (60 FPS)
- 1/3 inch
- YUV format
- 8 bits of Y per pixel
## Bill of Materials

<table>
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<tr>
<th>Product</th>
<th>Quantity</th>
<th>Manufacturer</th>
<th>Price</th>
<th>Purchased</th>
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<td>OmniVision</td>
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Schedule

• Start During Summer
• September 1\textsuperscript{st} – Initial Camera Interface
• September 1\textsuperscript{st} – Initial LCD Interface
• October 1\textsuperscript{st} – Initial FPGA microcontroller implementation.
• November 1\textsuperscript{st} - Integration
• November 15\textsuperscript{th} - Physical Hardware Design
• December – Debug, Prep for Demo
Risks

- LCDs might completely obscure vision
- Microprocessor might not be fast enough for image processing
- Camera pixels may not easily translate onto screen pixels (see simulation)
- LCD interface components might not be able to sustain the targeted 30 frames per second