

Midterm project

ME297

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Midterm Project: Part 1

Fixed-focus VGA digital camera objective specs

- Using an optical design software define the starting points for the following specs, find an appropriate starting patent and scale the patent to your system size and calculate the all the appropriate parameters to show that your lens meets the specs. If the lens system does not meet the specs then perform an optimization routine with appropriate constraints so that it meets the specs. Find the closest sensor and the glasses (with prices and venders) to what you have found through your calculations.
- Number of elements: 1-3
- Material: common glasses or plastics
- Image sensor:
 - Resolution: 1280 X 960 (horizontal X vertical)
 - Pixel size: 3.7 X 3.7 microns (assume one color pixel per cell)
 - Sensitive area: 4.74 X 3.55 mm (horizontal X vertical)
- Objective lens:
 - Focus: fixed, depth of field 750 mm (2.5 ft) to infinity
 - Focal length: fixed, 36.0 mm
 - Geometric Distortion: < 4%
 - f/number: Fixed aperture, f/3.5
 - Sharpness: MTF through focus range

Low frequency 34 lp/mm	>90% (central)	>85% (outer)
High frequency, 102 lp/mm	>30% (central)	>25% (outer)

- Vignetting: Corner relative illumination > 60%
- Transmission: Lens alone >80% 400-700 nm
- IR filter: 1 mm thick Schott IR638 or Hoya CM500

