Bruce L. Cannon

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PROFESSIONAL and SKILLS SUMMARY

Strong experience in Research and Development for technical companies.   Innovator for engineering systems for consumer and defense. Leader of prototype development teams for new products. Multiple-patent holder for lens and systems.
Optical lens and systems designer for products using: Visual, Illumination, IR, Laser, Projection and Sensor optics, with lens forms of refractive, reflective and zoom.
System architect for LCD &MEMS projection displays: LED illumination, polarization.
Optics design codes; Zemax, Code V, OptisWorks in SolidWorks, Light Tools, Trace Pro.

ENTERPRISE EXPERIENCE

Radius Optical Engineering   (Also: PhotonWrangler Consultants)

Consultant Services For Optical Systems Design And Manufacture.

- Analyzed and toleranced Three-Mirror Anastigmat Telescope for broadband sensing. Improved alignment method for robust accuracy in high-volume manufacturing.
- Designed large aperture interferometer for infrared metrology, saving over $200k in hardware costs, and yielding specific-use higher volume testing.
- Created Laser collimator and beam expander lens for CO_2 manufacturing systems: lens design, opto-mechanical assembly, and manufacture.
- Designed and sourced Infrared microscope objectives.

CAREER SUMMARY

3M Precision Optics (Previously USPL)   Portland, OR   (1999-2007)

Lead Optical Design Engineer—LCD Commercial Television Projection Research Group.

- Led team to improve performance and economy of projection lenses. Invented new lens forms and mounting techniques to cut element count by 40% and improve corner resolution —4 new forms built and three patents granted.
- Created new engine architectures to enhance television cabinet forms using wide-angle lenses, novel folding and catadioptiric optics--8 patents applied.
- Organized and taught optical seminars in use of Zemax software for optical design, lens mounting analysis and thermal tolerancing.
- Built ultra-bright LED illuminator, using micro-positioned Diode array with water-cooling, with brightness/area improvement of 5x over 2 years.
- Developed LCD projection system from lamp-to-screen: Optimized illumination systems using arc-lamp and LED arrays. Innovated LCD display architectures for all imagers -- HTPS, LCoS, and DLP.   Designed custom Projection lenses and screen/cabinet layouts.

Evans & Sutherland Computer Co.   Salt Lake City, UT   (1990-1999)

Senior Optical Design Engineer—Flight System Projection Display Systems Group

- Designed head-tracking displays with two fields: wide angle with high-resolution inset --projection optcs directed through two-axis gimbaled periscope.
- Created Helmet and Virtual Reality displays using miniature CRT and LCD with fisheye projection lens and polarization sensitive screens.

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- Implemented new projection lens use for improved pilot view. Designed analyzed and tested extra-wide angle lenses for simulation and star field projection.
- Installed and tested high gain textured projection screens in training dome for improved brightness and image uniformity.

FLIR Systems Inc.   **Portland, OR**   **(1987-1990)**

Optical Systems Designer

- Created Three Mirror Anastigmat telescope for dual band radiometer. Procured off-axis mirrors, and built optical assembly.
- Initiated program to improve detector efficiency to reduce ghosting and narcissus.
- Designed Infrared refractive zoom with 9:1 zoom range using aspheric lenses

EDUCATION

Master of Science, Optics

University Of Rochester, Institute of Optics   Rochester, NY

Coursework: Physical & Geometrical Optics, Radiation/Detectors, Lasers, Lens Design, Fellowship and internship program with Hughes Aircraft EDSG.

Bachelor of Science, Physics

Utah State University   Logan, Utah

Minor in mathematics, Minor in French   Cum Laude Honors, GPA 3.85

PUBLICATIONS, PATENTS

7,029,130 Contrast and brightness enhancing apertures for illumination displays

7,009,777 Compact projection lenses for use with large format pixelized panels

6,765,731 Low element count projection lenses for use with pixelized panels

6,726,332 TIR prism for DMD projector

6,532,044 Electronic projector with equal-length color component paths

6,411,437 Integrating polarization conversion system

5,268,337 Wide Angle, Video Rate Imaging Range Finder and Method