

## Photonics for Design

Optical design is the art of modelling and engineering an optical setup to meet a required performance, footprint, cost and other constraints. CAPPA has the expertise and a suite of advanced software modelling tools to address a range of design tasks, from simple illumination to complex optical components and complete optical engine design.

### Case Study: Inferneco

**Customer Problem:** Inferneco is a start-up company delivering products primarily to the fire lighting (ignition) area. Recently through contacts in the drinks industry the company started exploring the idea of developing a simple disinfection unit that would work in a variety of public establishments.

**CAPPA Contribution:** CAPPA were involved in the design and manufacture of a prototype for the company to use as a showcase to potential customers.

**Project Outcome:** CAPPA was able to help Inferneco with initial feasibility of their product, assistance with navigating the funding sources available to them and the introduction and engagement available to develop a ready to market product.



### Case Study: EnteraSense

**Customer Problem:** EnteraSense is a start-up company developing an ingestible biosensor that detects bleeding in the gastrointestinal tract in real time without requiring a complicated intervention. The company approached CAPPA with a view to developing the optical elements of a swallowable pill. The unit had to be small enough to fit inside a pill shaped container which the patient would ingest.

**CAPPA Contribution:** CAPPA investigated a variety of ways in which the signal detection could be improved, implementing bespoke LEDs, filters and detection systems. CAPPA investigated appropriate layouts of the optical components in order to produce the most efficient design.

**Project Outcome:** CAPPA helped develop a demonstrator prototype to exhibit at high profile medical device conferences.

### Optical Design Process

#### Design Specification

Requirements & Specifications  
Limitations & Restrictions

#### Design Concept & Development

Ray tracing, mapping, colorimetry, etc.  
Parts selection/specification, integration

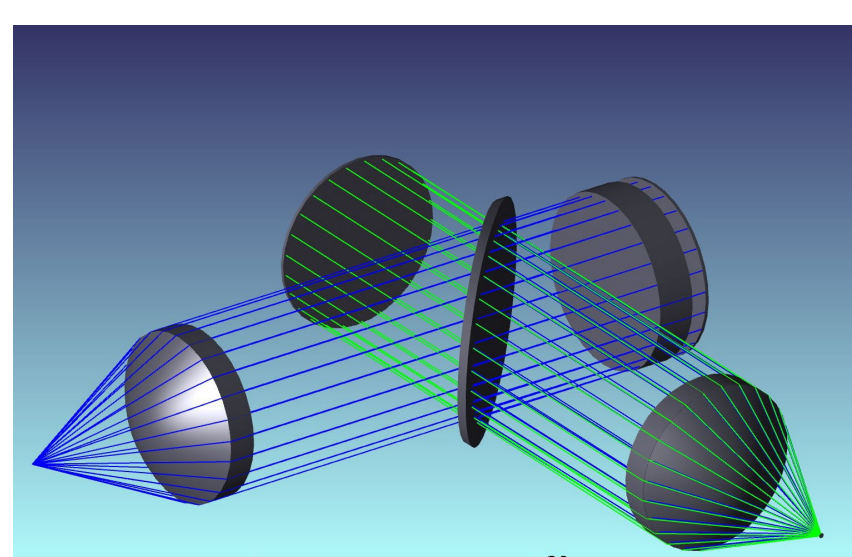
#### Design Verification

Test and measurement  
Prototype build

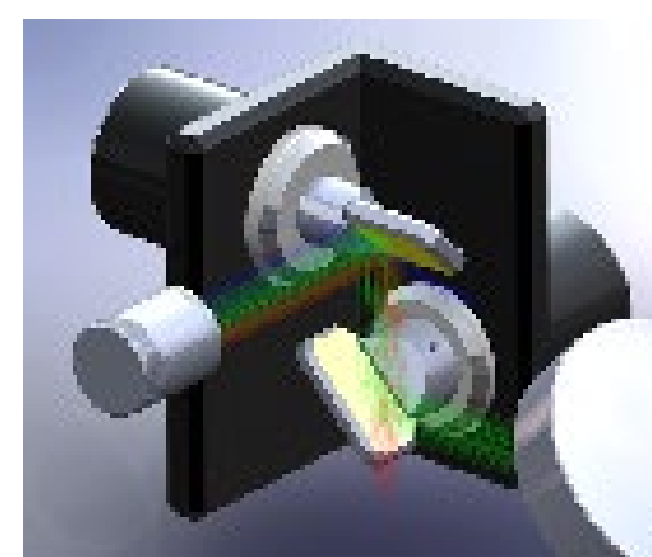
#### Solution Delivery

Reporting & documentation  
Training

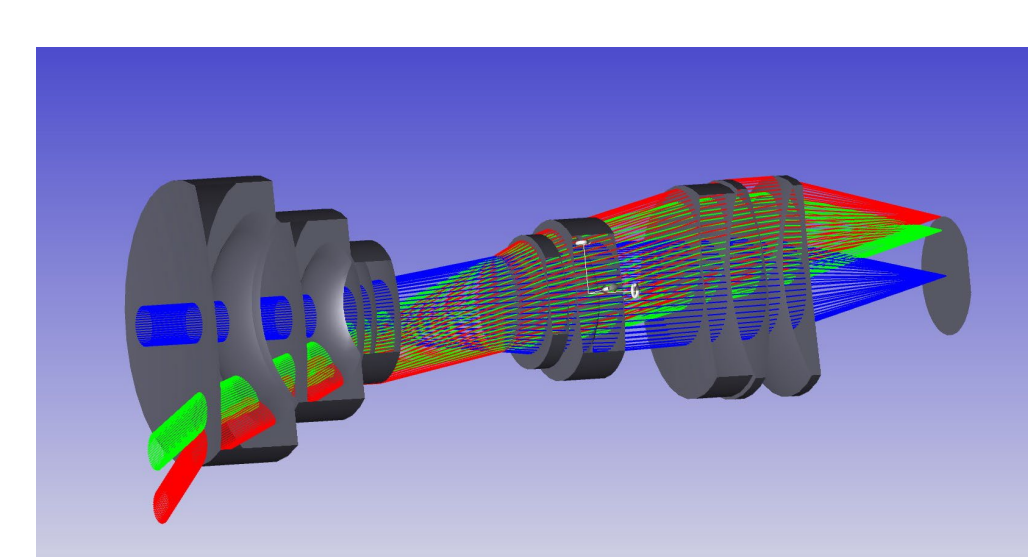
Applications	Sectors
Laser optics	Retail/ advert/ industrial/ interior lighting
Off-the-shelf component selection	Exterior/ building/ public space lighting
Design enhancement & integration	Machine vision
Illumination systems modelling	Specialist e.g. medical device/sensing
Customised optical component	Food and beverage
Lens design	Pharmaceuticals
Imaging and detection systems design	Medical device



Zemax



Dialux



Autodesk Inventor Professional