

A New Display Technology Using Nonlinear Wavemixing for Smart Glasses

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Smart glasses are set to become the next mass-consumer technology. We have developed a new see-through display that can enable its adoption as well as allowing use-cases that will improve people's lives. The requirements are:

1. Look like regular glasses – transparent, confidential
2. Allow for corrective eyewear – must be curved
3. Create a convincing display with high brightness



Challenge

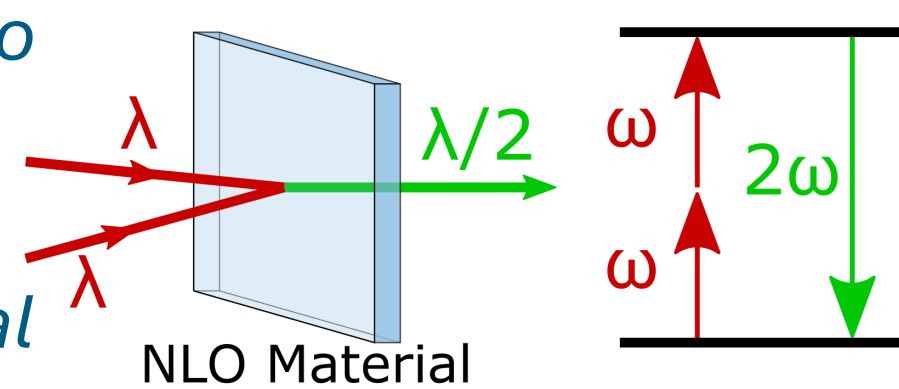
How to superimpose natural and digital views through a transparent display?

Current method: Use linear optical approach (mirrors, diffractive gratings). But there are issues:



Nonlinear Optics

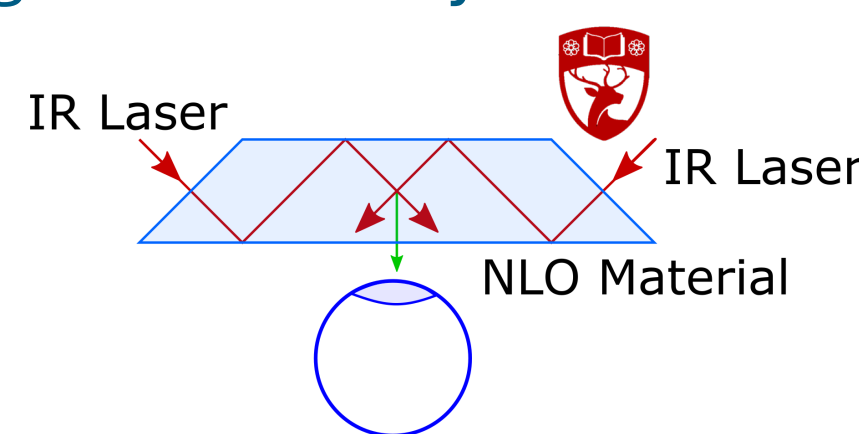
Our solution is to combine laser light inside nonlinear optical (NLO) material



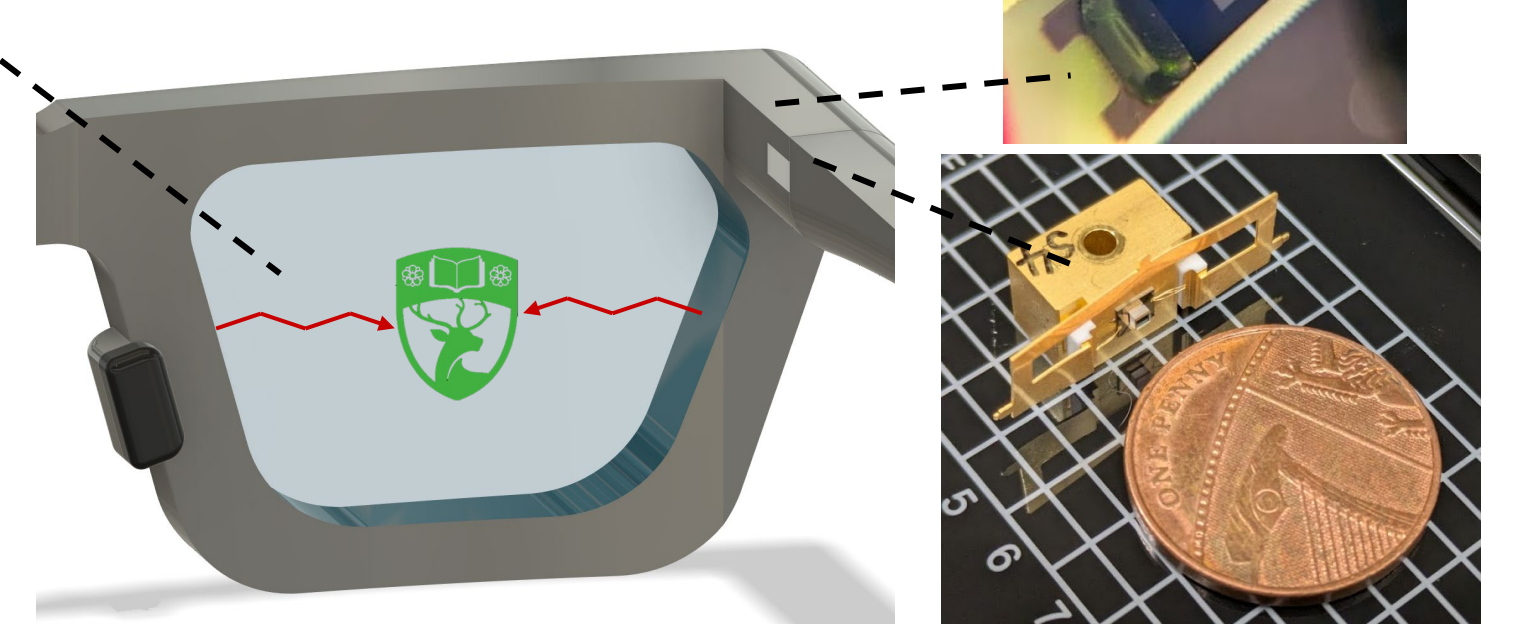
- Works in fully transparent material
- Full control of light direction
- High brightness laser light

Nonlinear Wavemixing

Inject infrared (IR) light with desired image into NLO material to generate visible light towards eye



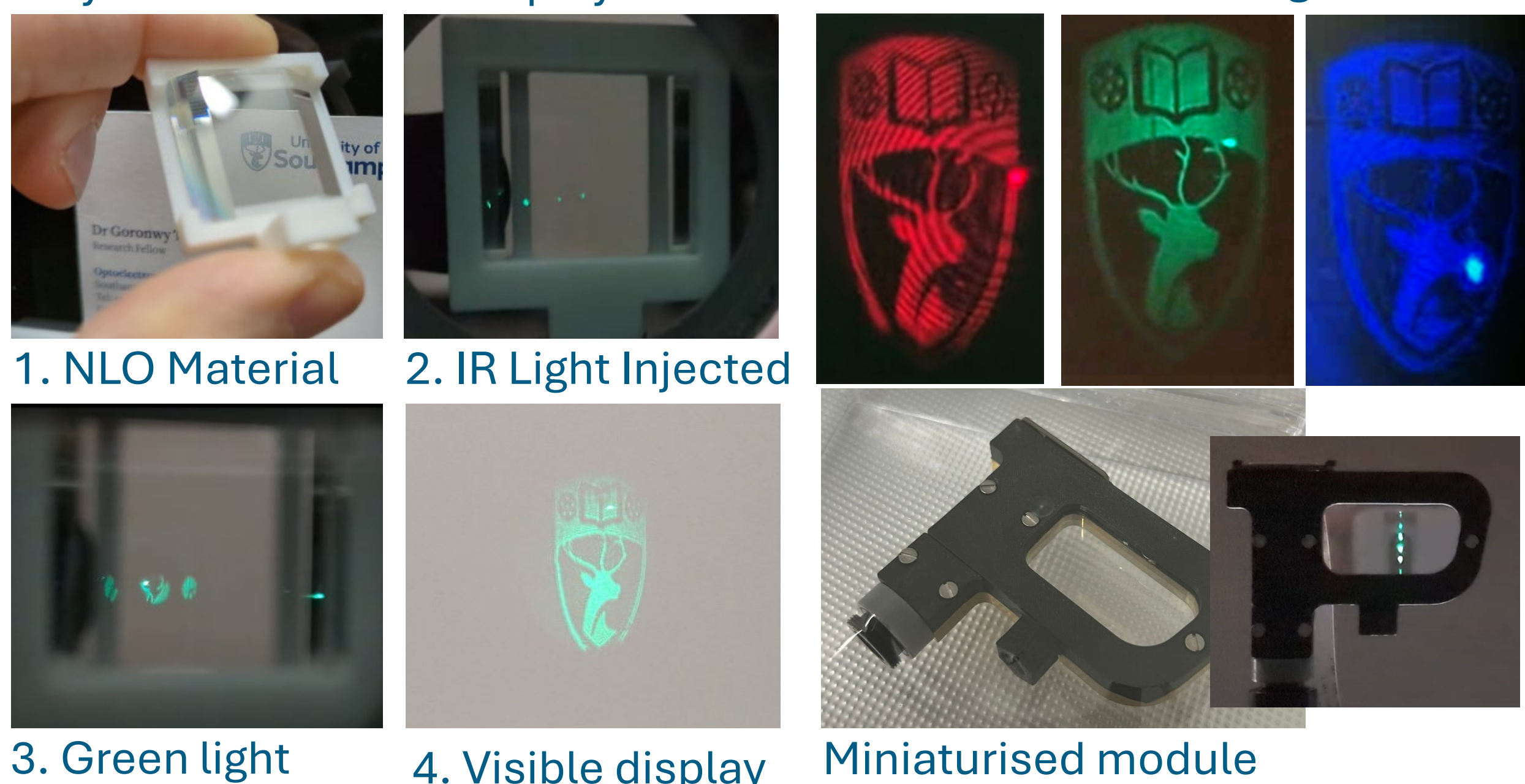
Miniaturised modulator and IR laser in frame



Results

Plays real-time video display

RGB with different IR light



Applications

