




PHOTONIC CRYSTAL FIBRES

MACHINE LEARNING

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Project Details:

- Photonic crystal fibers (PCFs) are the specialized optical waveguides that led to many interesting applications ranging from **nonlinear optical signal processing to high-power fiber amplifiers**.
- Various optical properties including effective index, effective mode area, dispersion and confinement loss for a solid-core PCF are measured.

ALGORITHMS APPLIED:

- Multivariable Linear Regression
- Artificial Neural Network

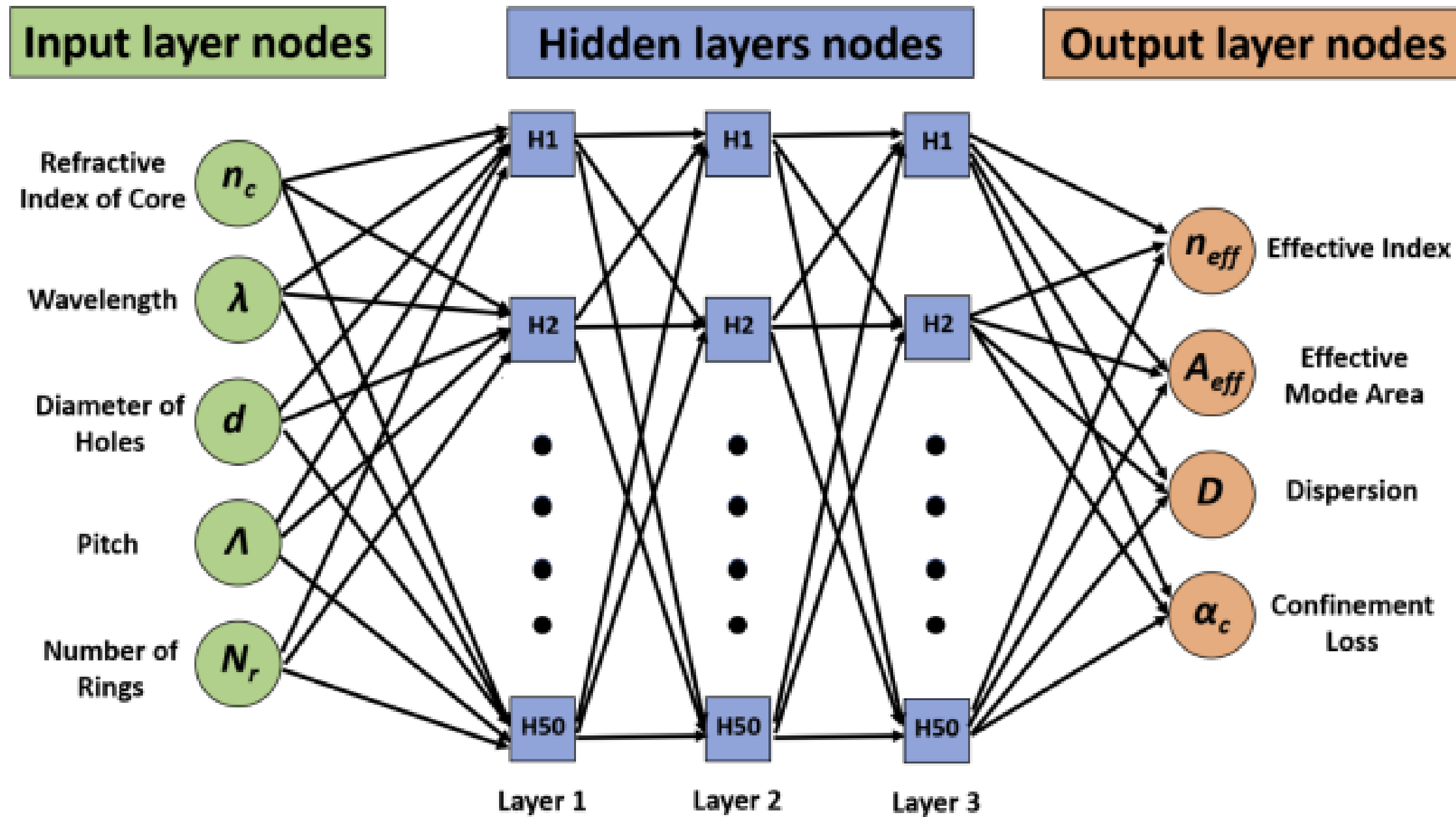
Dataset Details:

- **140 data * 7 sheets**
- **6 input variables**
- **4 target variables**

Performance Parameters calculated:

- **R2 Score**
- **MSE**
- **MAE**
- **RMSE**

Input and Output Layers:



RESULTS

	ANN			
	Neff	Aeff	Dispersion	Confinement Loss
R2 Score	0.966	0.955	0.92	0.989
MAE	0.017	0.0149	0.0161	0.0191
MSE	0.00052	0.0019	0.00056	0.00071
RMSE	0.023	0.044	0.023	0.0267

	Multivariable Linear Regression			
	Neff	Aeff	Dispersion	Confinement Loss
R2 Score	0.834	0.893	0.196	0.918
MAE	0.012	0.216	94.29	1.41
MSE	0.00022	0.124	13297.04	3.31
RMSE	0.014	0.352	115.31	1.82

The top-left corner of the slide features a series of overlapping, stylized geometric shapes. These include a dark teal triangle pointing towards the top-left, a bright yellow triangle pointing towards the bottom-left, and another dark teal triangle pointing towards the bottom-right. The shapes are layered, with the yellow one in the middle, and the teal ones on top and bottom, creating a dynamic, abstract graphic element.

Thank You