



Fibre sensor testing

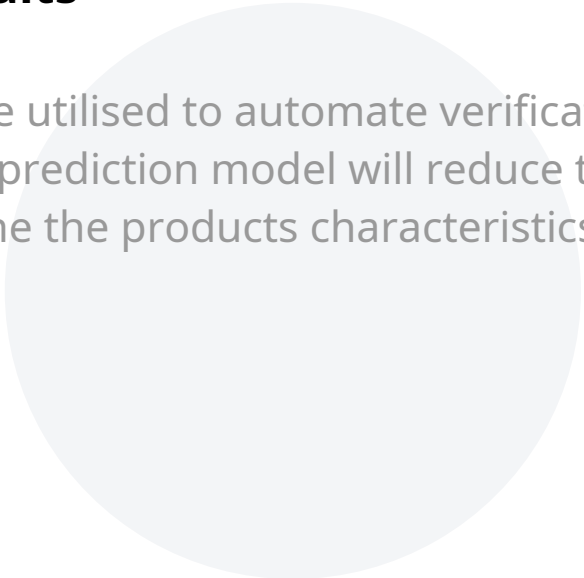
Predicting Characteristics

Cezary Gruszka



Goals

Extrapolating test results



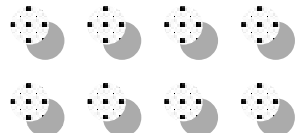
Machine learning can be utilised to automate verification of sensors. A well tailored prediction model will reduce the need for testing to define the products characteristics.

Advantages of Prediction Models

- Replaces costly processes
- Frees up human resources
- Speeds up testing
- Reduces product validation needs



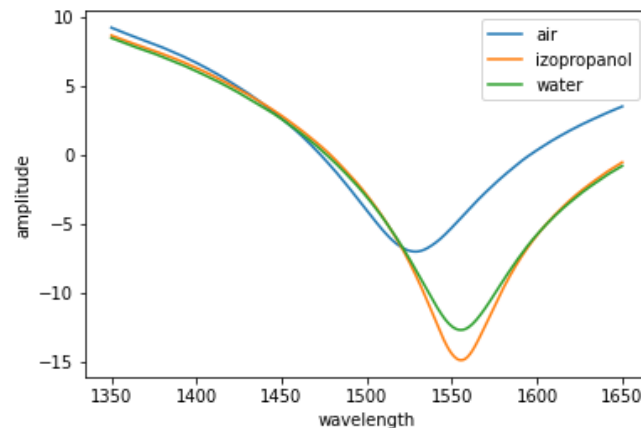
Illustrations by Pixeltrue on
[icons8](#)

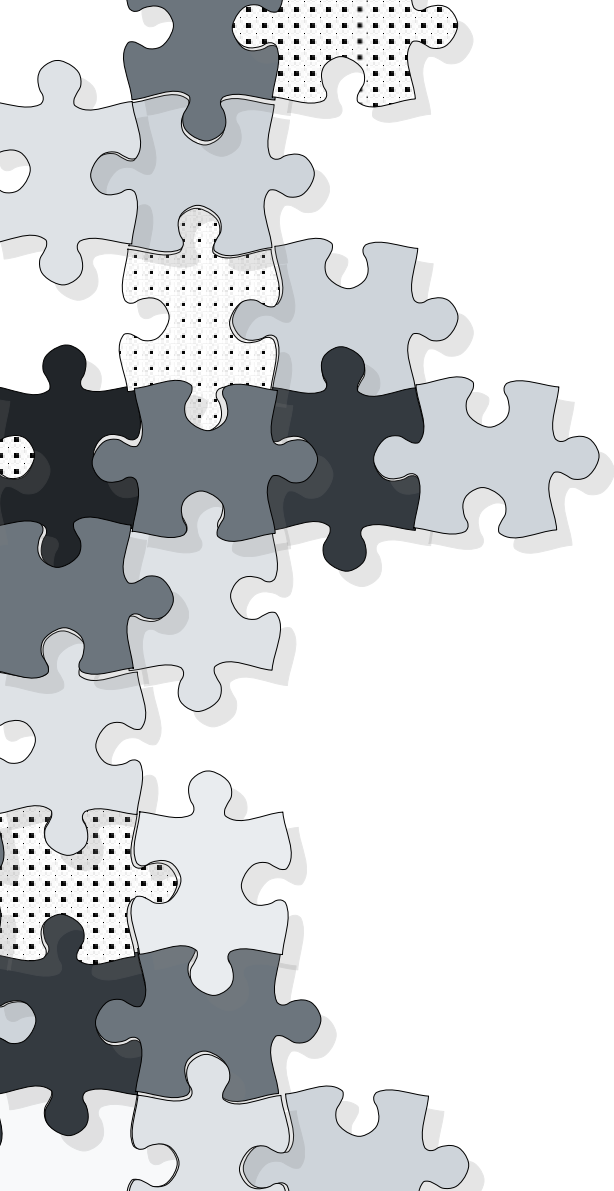


Sensor verification

Gathering data

Verifying our sensor is a very repetitive process. We make measurements in one environment, then the next, then the next... each more problematic than the last one. What if we could get all necessary characteristics from just one reading?



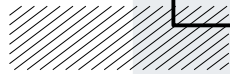


“

In the end you should only measure and look at the numbers that drive action, meaning that the data tells you what you should do next.

”

- Alexander Peiniger, CEO at Quintly



Need convincing?

Investment costs

Data required for predictions is the same data that is already gathered and stored. No upfront investments required.

Human resources

Testing such devices is a long process that requires a lot of work by multiple people.

Why go to all the trouble when a person with a laptop is all you need?

Decision making

Want to experiment with your product? Try different ideas without certainty they will be good enough? Why not simulate the results before throwing money at something that might not work.



Time requirement

A simple model can train in seconds. Even with tons of data and complex models, a couple hours overnight and it's good to go!

Risks

Unsure if a prediction can really replace a reading? You can just make a measurement every now and then to compare with.

Does it work?

Only one way to find out...

Creating Prediction Models



Analyze Data

Using existing data we further our understanding of the problem, pin-pointing important data that can be of use in the future.



Data Processing

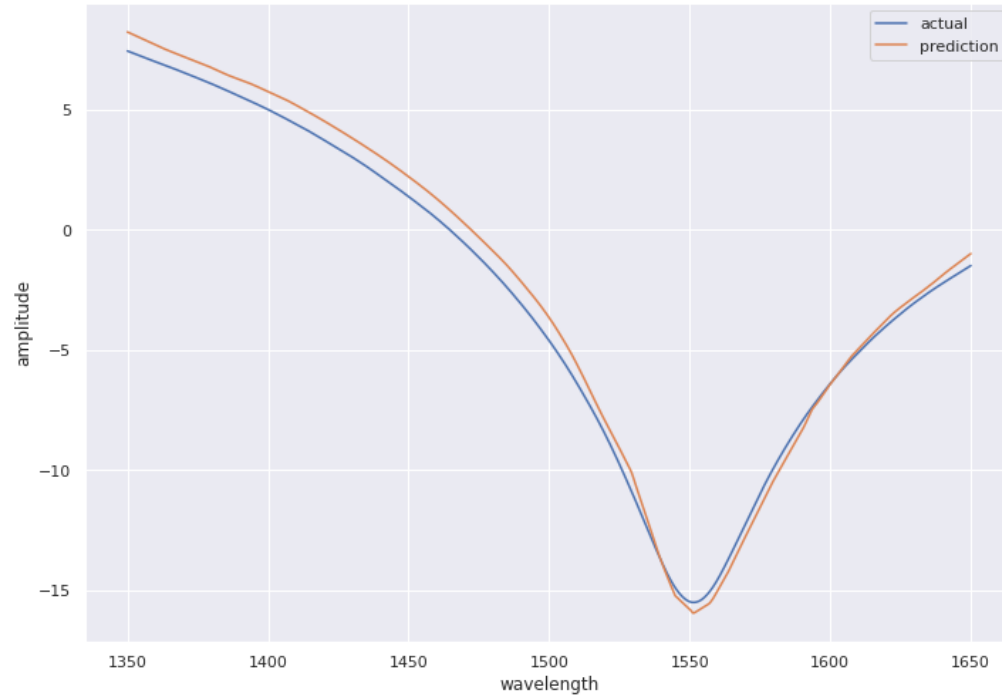
With a full understanding of our data and the potential it offers, we isolate important data points that can be used to make predictions.



Modeling

With our data processed and prepared, we let our model learn on the data we have. Armed with this knowledge, it can replace many manual processes entirely.

Results




Now imagine if our model could use hundreds of data sets, instead of just ten...



Is data science a good fit?

Can it really help fibre optics?



Whilst all businesses have something to gain from the data they gather, what does data science truly offer us?

Information

Isn't that exactly what gathering product characteristics is all about?



Conclusion

Summing up, my solution achieves the the set out goals of reducing costs, monetary and otherwise.

Specifically:

- Allows avoiding costs of the physical process
- Eliminates most human resource needs
- Dramatically speeds up the validation time
- Eliminates the need for multiple enviroments

I hope you can see the value this my product provides,
as well as the potential it has with more resources.

The rest is up to you.



Photo by [Dave Hoefler](#) on
[Unsplash](#)