



## Case Study



# MODULAR IMAGE RECOGNITION

... just what the doctor ordered!

*Prime Vision supplies customised solutions for a wide range of image interpretation applications and one of its unique ingredients is flexibility. Whilst most systems cannot be changed or enhanced without incurring considerable cost, Prime Vision's open architecture provides a growth path. Once its software platform is in place it's simply a case of adding or modifying modules and this is precisely the reason why it won the contract to create the database structure for a world-first, on-line plant disease diagnosis service for the leading Dutch laboratory BLGG.*

## Unique plant disease identification tool

This unique commercial service goes live summer 2009. Called Plant Doctor, its front end will provide BLGG's customers across the world with an easy to use plant disease identification tool. It will initially provide access to BLGG's own, huge digital collection of plant pathology images and help the user determine if what's on the screen is the same as what he sees in his greenhouse. Fundamentally it will steer the user in the right direction.

Plant Doctor will also invite the user to upload an image of the problem. Having selected the appropriate plant genus the subsequent process is question-driven, gradually narrowing the field of diagnosis. Ultimately a report is automatically generated which is verified by an expert before being made available for download by the customer. However, as the report has effectively been pre-qualified, it ensures the expert's time is optimally spent.

Established in 1928 BLGG has grown into a leading laboratory in the horticultural and agricultural sector. Every year it analyses some 500,000 samples and has branches and partners in over 50 countries. In common with Prime Vision its roots can be found in state sponsored research.

## Added value

"Plant Doctor has come into being for several reasons," explains Plant Health Manager, Dr. Daniël Ludeking. "We want to add value to the service we currently provide and optimise communications with our customers. From a commercial standpoint we are anticipating that this service will encourage more visitors to our

website and drive demand for our fee-paying expert analysis service that is the next stage on from the Plant Doctor."

Currently, commercial plant or vegetable growers have limited options. They can key in the plant problem as a search term on the Internet which may generate several hundred hits and not provide a conclusive answer. And growers stand to lose a lot if the diagnosis isn't correct. Alternatively they can send a sample to laboratories such as BLGG for expert analysis. Whilst this may be easy for a customer in Europe, it represents quite a lot of hassle for one in Ecuador! Ultimately of course a physical sample may still be required but at the very least Plant Doctor will provide a trustworthy first port-of-call.



## Automatic image comparison

The ultimate goal is to conduct this image comparison automatically, in other words a true vision application. However once development of the system was underway it became clear to both BLGG and Prime Vision that this could not be achieved in the short term. Many issues such as the widely variable quality of the incoming digital images would need to be addressed. Accordingly, BLGG decided upon a phased development and this was eminently

### At a glance:

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achievable with the flexibility of the Prime Vision package.

Initially six of the most popular plant genera have been fed into the database designed and mapped by Prime Vision. These are roses, chrysanthemums, gerbera, peppers, tomatoes and cucumbers. As fruiting vegetables in particular are prone to a lot of different viral, bacterial and fungal problems the eliminating questions in these categories are extensive. However the site also includes some generic sections to extend the scope of the site whilst more plant groups are added. Identification of diseases relating to open field crops such as sugar beet, wheat and other grains is also in view.

"Our aim is to help professional horticulturalists and growers optimise their production and lower their costs," continued Daniël Ludeking. "Plant Doctor will also add value to the service our distributors and agents provide too. In many remote areas these companies act as the source of supply for all the growers' needs. They will be able to use our service, translate the findings into the local language and help their customers to achieve the best yield."

## Disease containment

The service will also help with disease containment. Clearly it is not ideal for a diseased plant sample to cross the border into a country where it is either unknown or has been eradicated.



"Clavibacter is a good example," Daniël Ludeking explained. "It's common in tomatoes grown in Spain, Turkey and other south European countries but it is not known in the Netherlands."

Understandably growers are reluctant to send samples of such quarantine diseases for fear of

spreading the problem. Also, as the report is provided by email the grower has the early opportunity to adopt the hygiene protocol recommended by BLGG to contain the outbreak.



## Web-enablement

Another big plus for the Prime Vision system is web-enablement. Whilst many of its image recognition projects start out as being site-specific they prove so successful that they are ultimately deployed across a number of sites or even nationwide. The obvious benefit is that resources can be better shared and scaled across a complete enterprise network.

This has considerable attraction for BLGG. Physical plant analysis work is undertaken at its site in Wageningen which contains all of its biological, microbiological, nematological, bacteriological and residue laboratories. And its site near Arnhem is responsible for the chemical analysis of soil, water and fertilisers. Daniël Ludeking adds, "The Prime Vision system will allow us to manage our analysis service better, right across the company."

"We anticipate the payback on Plant Doctor to be within two years," he continues. I think this is easily achievable if the service generates the expected analysis work from abroad. And who knows, as time goes on we may even be able to make automatic photo comparison a practical and viable option."

With Prime Vision the ability to grow an image recognition system in line with the customer's needs and resources is in-built. The result is a system that always works optimally and can evolve to accommodate new business opportunities.

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