

THE Cruncher

Help us to help you!

At HRS we provide a number of services to our client base, in addition to the basic one of supplying software.

Because of our unique position, where we have agencies for a wide range of products, all of which we understand well, we are well-placed to advise people on the benefits and limitations of particular products for specific purposes.

We are often in a position where we are aware of products that can save clients large amounts of time and money. We can't force people to use them but we enjoy telling people about them.

We can make it possible for people to try software themselves. We frequently work on people's own problems to demonstrate the way in which software can be used to meet their needs, because it is usually quicker for us to understand the problem than it is for the client to understand the software.

Software from reputable companies is always being improved and developed. We keep clients informed of the improvements, and can point out products which have improved so much that they make the previous market leaders look old-fashioned.

Sometimes things go wrong with software products or licenses. We have often found that we are more effective than our clients when it comes to dealing directly with the manufacturer.

We can provide these services much more efficiently by email. If you are not already one of the 4000 or so people who receive our eNews letter, and want to be kept up-to-date on tools that can assist you to work smarter, then email your name and job title to info@hrs.co.nz.

New releases

The following products have had new versions released in the last few months. All are described in this newsletter – contact us for more details. All maintenance upgrades except for Mathcad have been sent to customers - call us if you are still waiting.

MATLAB – R14 SP3

Mathematica 5.2

Mathcad 13

Remark OMR 6.0

Forecast Pro Unlimited 4.4

Grapher 6

Recent seminar tours

In August we conducted seminars around the country with guest speakers, both of which attracted more than 100 registrations. The first was an introduction to *Mathematica*, by Sarah Flannery of Wolfram Research, and the second was a presentation by Shane Underwood on MATLAB and FEMLAB for finite element modelling. The feedback forms were overwhelmingly positive, and we thank all those who attended.

If you or your colleagues missed the tours and would like information on the products, please email info@hrs.co.nz and explain what you would like to know.

XML and MathML developments

For most of us involved in mathematics, XML and its cousin MathML are things we have heard of but don't understand. However, they are here, now, and are rapidly becoming more pervasive.

MathML is a low-level specification for describing mathematics as a basis for machine to machine communication. It was originally developed to provide a much-needed foundation for the inclusion of mathematical expressions in Web pages, but it is now being used for much more than this. Mathsoft invested heavily in making its primary file format an XML format, *Mathematica*, Maple and Scientific Workplace can read and save documents as MathML, and now Design Science, makers of MathType, are working with publishers of XML editors to create MathML capable products and solutions for all phases of the mathematical publishing process. (See www.dessci.com/en/products/mathflow/)

This area is rapidly developing, so not all products work with each other yet, but anyone using mathematical software or interested in publishing mathematics should keep an eye on developments.



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Data mining with STATISTICA

HRS has this year sold the full *STATISTICA* Data Miner program to two large commercial organisations in NZ. There are also academic users and commercial users who have purchased separate parts of the data miner package, such as CHAID or Neural Networks.

STATISTICA is now well-known and trusted, although one of our customers did

enquire over a business lunch "How come you guys can provide all this functionality so cheaply?"

If your organisation is doing or contemplating data mining, then give Darrel a call so he can explain the benefits of using *STATISTICA*. You may end up paying less money than you do at present, and get more useful tools.

Surveys using hand-held computers

We sell a number of programs that make the task of designing and performing surveys much easier than it is when you use only the MS Office programs. Several of these have tools for loading surveys on to hand held computers and PDA's.

We would like to work with people who are contemplating carrying out or improving their surveys using these tools, and to provide free trials of the software.

Contact [Darrel](#) if you would like to know more about PDA surveys.



HRS now hosts your Internet surveys

We are now set up to host surveys for people who want to carry out surveys using the Internet or their Intranet, but who don't have an accessible web server of their own.

This is a low-cost service for people who use the survey programs that we sell. (Perseus Survey Solutions, Apian SurveyPro, and The Survey System.)

We have already provided this service to a number of clients, and have registered a domain name for this purpose. You can send people directly to this site, or you can put links in your own web page so that most people are not aware that you are not hosting the service yourself.

Contact [Darrel](#) to see if we can help and to discuss pricing.

Forecast Pro Unlimited 4.4

Forecast Pro is a state-of-the-art statistical forecasting package that uses artificial intelligence and powerful methodology to yield unsurpassed forecasting accuracy.

In expert selection mode, Forecast Pro Unlimited uses a rule-based expert system and proprietary statistical algorithms to analyse large batches of data. It automatically selects appropriate forecasting techniques and creates forecasts, so that users with little or no forecasting experience can use the program effectively.

Improvements in this version include:

- Improved expert selection logic
- More comprehensive input and output
- Improved tools to allow single users or groups of users to over-ride the forecast on the basis of their knowledge of upcoming changes in conditions.

(Users who wish to explore a few time series in depth should ask us about Forecast Pro XE.) Contact [Darrel](#).

Grapher 6

If you need to graph data, and do not need any tools to help you to summarise the data before making the graph, then Grapher may be the high quality, easy-to-use, low-cost tool you need.

The latest features include using graded fills, individually controlling the colour of the bars or points in a graph, displaying only part of a polar plot, controlling the default values for all objects, and creating vector plots, contour and surface plots, among many other features. Many of the features are relevant to geologists and geophysicists.

Contact [Darrel](#) to try it out, and for details and pricing.

An on-line introduction to STATISTICA.

We have prepared an introduction to *STATISTICA* as a set of HTML documents that you can access from our website page www.median.co.nz/statistica/Statistica_Intro.html.

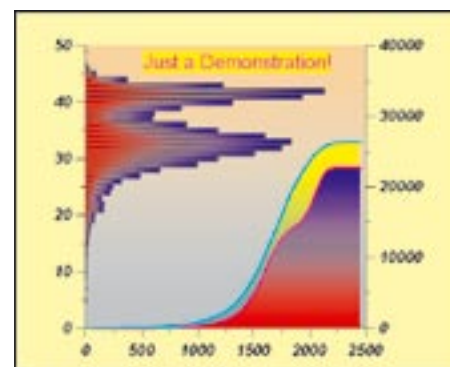
If you have access to *STATISTICA* on your computer, you can treat these documents as a tutorial, or otherwise you can just read them as a detailed exposition of features of the program. Let Ray know what you think of them, at ray@hrs.co.nz.

Remark Office OMR 6.0

Remark is a forms-processing software package for surveys and tests. The software recognises optical marks (bubbles and checkboxes) and barcodes. The interface for this new version of the software has been completely updated. In addition to the new look and feel, you will find a task pane on the left side of every window to help you navigate the software. This task pane updates automatically based on the last step performed to help you understand your possible next steps. Other major improvements affect the database and the data analysis tools.

Existing users will want to upgrade, and those of you who are still doing manual entry of data should consider whether scanning will save you many hours of time per survey. Contact [Darrel](#).

This Grapher 6 graph demonstrates the use of graded fill patterns and filling between lines.



MATLAB R14 SP3

The third service pack for MATLAB R14 has already been sent to most users who are on maintenance. (A service pack is a collection of bug fixes, features, and Web releases made since the last general release, captured in a full media set.)

This pack provides updates to MATLAB, Simulink, and 75 other products. The primary focus of this service pack is on quality, but it also includes new features for data analysis, large-scale modelling, fixed-point development, and code generation.

Products with major upgrades include Financial Derivatives Toolbox 4 and Genetic Algorithm and Direct Search Toolbox 2. See www.mathworks.com/sp3. Do seriously consider installing SP3, and if you are up to date with maintenance and do not get it soon then please contact Marc.

PLECS

This product is used for high-speed simulations of electronic systems, and is particularly applicable to power electronics with control systems. It is built as a toolbox that works with MATLAB and Simulink. The circuits are drawn in PLECS, and inserted into Simulink as a block. The circuit is automatically converted into the equations needed by Simulink, so that the user can concentrate on the electronics, not on the mathematics.

A key simplification used in PLECS is that active components are represented as ideal switches – this greatly speeds up simulation, without loss of information of use in power system simulations. (You can model without this simplification if you wish, though.)

Contact Marc for more details.

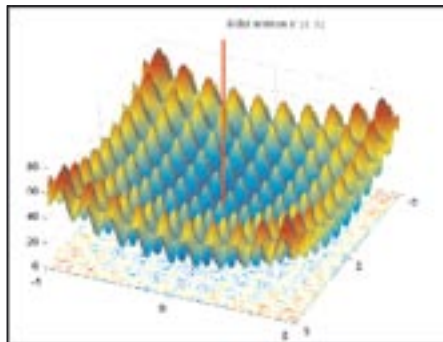
Upgrading Mathcad

Versions of Mathcad from version 8 and earlier will no longer be able to be upgraded after the end of this year. If your organisation has old copies that are unused, or only occasionally used, and which have not already been upgraded, you can get considerable value out of them by using them to upgrade to version 13.

We will have a cutoff date for receiving your order of 1 December, in order to allow us to process the sale in time, so start preparing for this soon. Contact Darrel to check that the copies you have are eligible for upgrade.

Genetic Algorithm and Direct Search Toolbox

The Genetic Algorithm and Direct Search Toolbox implements tools for using the genetic and direct search algorithms. You can use these algorithms for optimisation problems that are difficult to solve with traditional techniques, including problems that are not well defined or are difficult to model mathematically. Contact Marc for more information.



Rastrigin's function is often used to test the genetic algorithm because of its many minima.

FEMLAB

Many of you attended a recent seminar series we ran in which Shane Underwood demonstrated finite element modelling with FEMLAB. This product is assisting many New Zealand engineers and scientists with some amazing applications, mainly due to its ability to calculate multiple physical phenomena in the same model.

If you are having trouble solving a tricky problem using finite elements and also like the idea of working with MATLAB, then contact Shane Underwood at info@technic.com.au and see if he can propose a solution.

Mathcad 13

Mathsoft are continuing to develop this tool that all engineers can use to create powerful, auditable, quickly made calculation documents. Main improvements are in graphing, programming, management of units, linear algebra and solvers. For a more complete list go to www.hrs.co.nz/mathcadv13.aspx.

Mathcad gives the individual engineer improved productivity, while at the same time giving his organisation the ability to maintain a resource of reusable, auditable, and traceable engineering knowledge.

Darrel can give you more details.

SimBiology

SimBiology extends MATLAB with tools for modelling, designing, simulating, and analysing biochemical pathways.

Key features include:

- Access to all functions via the command line and a graphical user interface
- Stochastic, stiff deterministic, and nonstiff deterministic solvers
- Model components, including species, parameters, kinetic laws, reactions, algebraic relations, and units
- Project files that store models with simulation settings and user-defined plot types

See www.mathworks.com/products/simbiology/ for details.

Mathematica 5.2

This release concentrates on performance improvements. *Mathematica* now supports a 64-bit address space and multicore and multiprocessor environments, to handle the largest problems faster. Vectorisation adds even more speed.

The computations can be performed on a computer separate from the notebook interface, through a secure shell environment, in situations where a faster machine is accessible through a network. Go to www.wolfram.com/products/mathematica/newin52/ to see all the new features.

The Integrator

Wolfram have a tool on their web page that allows you to enter any expression and calculate its integral, symbolically. This illustrates the way *Mathematica* works, as well as being an example of the use of *WebMathematica*. To use the Integrator, go to <http://integrals.wolfram.com>. To see more examples that use *WebMathematica*, go to www.wolfram.com/products/webmathematica/examples/.



Free Public Seminars

We have enclosed a one-page flyer advertising a set of four seminars that HRS will conduct in Auckland, Christchurch and Wellington from 8-11 Nov. To see details on the Web go to www.hrs.co.nz/seminars.

For Engineers

If you are a senior engineer wondering how to capture all the knowledge that your staff is hiding away in spreadsheets, then come and find out about Mathcad and see how you can ensure that the calculations that support your whole organisation can be verified and re-used.

For Data Analysts

If you have data to analyse, whether in a bank, engineering organisation, or a government department, then come and see how the easy-to-use but powerful summarising, statistical and graphing tools in STATISTICA will help you, even if your budget is tight.

For Surveyors of attitudes and opinions

If you conduct surveys, on paper or on the Web, and are not using special tools developed for the job, you are not being efficient.

Come and see us demonstrate how SurveyPro or SurveySolutions can make your job less tedious and more accurate.

Free MATLAB Seminars

These will be presented in Wellington, Christchurch and Auckland from 23-25 November, by Dr David Wilson, Associate Professor in the Department of Electrotechnology at Auckland University of Technology. They are not described on the enclosed flyer - for details go to www.hrs.co.nz/seminars.

Robust controller tuning

While PID controllers are still the most common industrial controller, typically they are also abominably tuned. Studies have shown that simply improving the tuning of the existing PID controllers is one of the most cost-effective ways to optimise production.

This seminar will take the development of a commercial PID auto-tuner as a case study and show how MATLAB and Simulink can be used to test algorithmic ideas, proto-type hardware and shorten development time.

Rapid prototyping with Simulink

This seminar will explore a number of real-life engineering problems using the dynamic simulation tool Simulink, coupled with the optimisation toolbox in MATLAB. The focus is on rapid prototyping, with the stress on rapid. Problems from such diverse fields as controller tuning, system identification, ecological modelling, and GPS measurement will be discussed.

The solutions will be non-trivial, pragmatic, sometimes surprising, and occasionally unashamedly quick and dirty.

Public Training Courses

Mathcad training

We are pleased to offer a public Mathcad training course, in Auckland, on 30 November. Many companies are using Mathcad now, and it is easy to pick up the basics of Mathcad from the built-in tutorials. However, to get fully productive in the shortest possible time a training course from our MathSoft-accredited trainer is the way to go. Your productivity improvement will easily pay for the cost.

See www.hrs.co.nz/training, or contact Darrel.

STATISTICA training

Because of the significant number of sales recently made to large Wellington-based organisations we are holding the next public STATISTICA training course in Wellington on 22 November. Although many organisations prefer a course customised to their own needs, and we conduct several of these each year, others find it easier to send one or two people at a time to a public course.

See details of the public course at www.hrs.co.nz/training or contact Darrel to organise a specialised course.

MATLAB workshop

This is a half-day hands-on introduction to optimisation techniques using MATLAB and Simulink. We will cover data smoothing, curve fitting and modelling over disciplines as varied as ecology, control engineering and signal processing. You will get a good feel for the products used in the workshop, and you will then be able to extend your knowledge by experimentation.

The workshop will be held in Auckland on Friday 25 November - if it is well received we will conduct similar workshops in other centres next year. Register at www.hrs.co.nz/matlabworkshop.

Contacting us ...

We are based in Hamilton, but supply, support and demonstrate our products throughout New Zealand.

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