

Benefits of membership

The national club for all users of 32 bit Acorn computers and Pocket Books

- The Club's magazine, 'Eureka', written by members, is published and sent free of charge four times a year.
- Free software to accompany articles in Eureka is available on the Club's FTP site or can be sent to members on disc.
- Free Technical Help Service. We will do our best to solve any problems which you may have, by email, letter, telephone or fax.
- Special discounts for Club members from well-known companies.
- Regional open days and shows are regularly organised by the Club. Other events can be arranged on request.
- Special offers at shows and open days.
- Regional contact lists of other members, available on request.
- Opportunities to get involved in the running of the Club itself.
- School and Affiliate Membership available on request.
- Joining pack includes an extra copy of a recent issue of the magazine and software.

Annual membership £15

Europe £19 and rest of the world £22

The ARM Club, Merton Court, 38 Knoll Road, Sidcup, Kent DA14 4QU
Email: info@armclub.org.uk Tel: 07010 709849 (Flextel)

EUREKA

The magazine for members of

The ARM Club

**The Ron Briscoe
Column**

Free for all

**Winning games
with logic**



Issue 61 - 2007 No. 2

Editorial

The editor's comments on the world of RISC OS

HEADLINES – RISC OS set to dominate world computer markets

The Chinese are about to make RISCOS the compulsory operating system on all it's government and domestic PCs. A spokesman for the Chinese Internal Affairs Department informed Eureka that the switch to RISC OS was being taken due to the greenness (*not redness! Ed.*) of the operating system with it's small energy footprint and cost affective working envoiroment.

Well it is April when I'm writing this and I can see a flying pig zooming across the garden. Unfortunately RISC OS continues on it's slow terminal decline. Normally the doctors at this stage would recommend the life support sysrems be turned off but before they do so something stirs in the almost lifeless body giving hope that a recovery may be near.

Alas this is a false hope! The relatives are already fighting each other and have begun to dismember the almost lifeless corpse, each wanting a part of the body for their own! The bickering is reaching an uncontrollable level which will soon overload the remaining life support systems, bringing certain death shortly afterwards.

Perhaps this is for the best as most operating systems that have reached their sell by date are normally put down painlessly and buried in a museam of old technology.

Still maybe a new Dr Kildare (*who! Ed*)(*the editor is 21 on the 7th of April*) will. leap to the patient's rescue with a miraculus cure. The relatives settle their differences and all ends happily ever after!

Extract from 'Alternative Universes - working examples' by Lewis Andrews published by Hilltop Scientific Publications 2053

All opinions expressed in Eureka are those of the authors and not necessarily those of the Club or its committee members and officers.

© The Arm Club 2006



Contents

4 RISC Bytes

A round-up of some of the news and happenings over the last couple of months in the RISC OS world.

16 Free UNIX ut

Andy Burgess goes into detail with VIM, AWK and MAWK.

27 Inspiration and

Kevin Wells explains some of the inspiration for the writing of his programs and hopes that this will encourage others into the world of programming.

29 Wakef

Highlights and photos from the show.

38 The Ron Briscoe Column

Ron survives football rivalry and is able to spend a small fortune at the Wakefield show.

42 iMate

David Ruck plays with a new PDA and connects it up to a Netgear access point using RISC OS.

47 A9 a

The editor describes the fun and games when a member of the Invicta RISCOS Users Group turned up with a new A9home.

51 Unipod

Ralph Sillett fits a new Unipod to his Risc PC.

54 Winning games with logic part 17

Barry Aulton continues with his epic saga of games, robots and artificial intelligence.



The bell tolls for RISC OS!



RISC Bytes

RISC OS news over the last couple of months

VirtualAcorn extends support to include Windows Vista

VirtualAcorn are pleased to announce that, following extensive testing on the release versions of Windows Vista, we have extended our product support to include all versions of Vista. This support only extends to new “retail” versions of Vista and does not include any of the Beta or RC versions, as these have known issues that we have fed back to Microsoft.

VirtualAcorn are pleased that almost all the problems we reported have been resolved by the full Vista release and as such we are now supplying VirtualAcorn products on the basis that they are suitable for use on Windows Vista, as well as Windows 2000 and Windows XP.

The only issue with Vista that we are currently aware of relates to 64 bit versions. These versions will not allow the VirtualAcorn floppy disc driver to be installed, this prevent VirtualAcorn from reading Acorn format floppy discs. The 32 bit versions of Vista do not have this problem.

On-line Technical Support Assistant launched

In order to further improve our out of hours technical support service, VirtualAcorn have today made available a beta version of the Technical Support Assistant (TSA).

This is an online version of the system used in house to help diagnose and solve any problems reported by customers. The TSA will ask the user a number of

yes/no questions in order to diagnose the problem and provided the solution is known, will present it to the user.

In addition the TSA will link into the revised on-line VirtualAcorn Knowledge Base. This allows the TSA to provide a simple solution to the problem as well as provide links to more detailed technical articles.

The updated VirtualAcorn technical support services, including the Knowledge Base articles and the TSA, can all be found from the Support button on the main VirtualAcorn website at:

<http://www.virtualacorn.co.uk/support.htm>
(**<http://www.virtualacorn.co.uk/support.htm>**)

WAKEFIELD SHOW 2007

Yes! At last. The Wakefield RISCOS Computer Club is pleased to be able to announce that we will be holding another show this year. After much debate and discussion late last year we had selected a new venue, to replace Thornes Park Athletics Stadium. Unfortunately they kept failing to communicate with us, so we had to scrap that venue. Thus I have spent the last few weeks trying to find yet another alternative venue, and at least we have found one we feel is suitable. Due to the limit on time and other issues, it is inevitably a compromise venue.

The basic details are:

Show Date: Saturday, 19th May Public Opening Times: 10:30 am to 5 pm Cost 4 ukp (no advance tickets and we are sorry but we cannot accept debit/credit cards)

Venue:

The Mill House and Frobisher Suite Stanley Ferry Marina Ferry Lane Stanley
WAKEFIELD WF3 4LT

You will be able to get to the show by Road, Rail, Air and Canal, if you happen to have a canal boat you can moor up outside the show!

There is car parking and some catering – More details to follow on this later.

Regrettably it is highly unlikely we will have a show theatre this year, due to the various issues of finding our alternative venue, we felt it was more important to run the main show. There is a possibility of a demo area being available, but this will be dependant on the number stands booked, etc..

The show website will go live as soon as possible – this will be announced when ready.

This will be show number 12 ! and comes at the start of the club getting ready to formally celebrate 25 years of existence.

Exhibitors who are interested in attending or finding out more information on the event this year should ideally contact the show organisers as soon as possible and an information pack and booking form will be supplied.

The show organisers can be contacted by email at:
show2007info@wakefieldshow.org.uk or
show2007info@wrocc.org.uk

or you can ring Chris Hughes on 01924 379778

Organised by:

The show is organised by the Wakefield RISCOS Computer Club. **www.wrocc.org.uk**

Webgen2 v2.33 vailable for download

This version fixes a couple of minor bugs, as well as finally adding in the colourpicker that I've wanted to do for a long while.

A couple of extra renaming facilities have been added

There is an extended manual which can be downloaded from the same place as Webgen2 itself.

For those that don't know, !Webgen2 is a simple application that will take a directory of images, GIF, JPEG, TIFF, PNG, SPRITE and PNG at last count, and turn them into a complete web site/image gallery.

A Simple Themes Manager for RISC OS.

This enables easy switching between Desktop 'themes' (collections of icon sets, window tools, etc.). It comes with three sample themes to try out, and it's easy to modify existing themes to work with the system.

This is very much beta software: there will probably be bugs and stupidities in it. As it involves installing a folder in your !Boot sequence, you should only run this if you're reasonably confident you can restore things if they become messed-up. Installation instructions are in the !Help file within !ThemeMan.

The Themes manager was written on RO 4.42 and makes use of some Select features, but it has been designed to run on any RISC OS machine from 4.02 upwards (including the Iyonix), although testing has been limited on these machines.

The manager can be downloaded from

www.lym.iconbar.com/themes.htm

For some of the design considerations, you may also be interested in reading

<http://www.drobe.co.uk/riscos/artifact1708.html>.

Constructive criticism, comments and suggested improvements are welcome. Please read the !Help file first. The contact email address is on the website index page

Searchy version 1.50

Searchy is a (kind of) small application that provides you with a quick way to access search engines from the RISC OS desktop. New to this version:

Advanced Search now available from within the desktop (instead of sending you to a website) – Default window position can be saved to wherever you like, instead of always starting up at the bottom left – Slight change to the version numbering system – Various other tweaks and fixes

Searchy 1.50 is available from the Searchy website at

<http://www.andrewpoole.org.uk/searchy/>

or by choosing "Check for Searchy updates" in the Info window of a previous version of Searchy

UniPrint and NetFetch 3.01

UniPrint 3.01 – The popular UniPrint software reached version 3 at the SouthEast show last October, and this show sees the release of 3.01. The big addition in 3.01 is support for raw “pass through” of text output (eg. from BASIC programs) over UniPrint. This means that (printer-permitting) you can send codes to your printer from BASIC, using UniPrint as a link. v3.01 also includes scanner updates to deal with problems with Epson scanners and some all-in-one units

NetFetch 3.01 – NetFetch and DialUp are popular internet access and mail/news/RSS transfer programs. The latest version includes updated anti-spam rules, enhanced RSS feed functionality, updated interface elements (for ease of use) and the ability to specify how the anti-spam rules work for each mailbox.

SuperDoku 1.09 released

Sine Nomine Software are pleased to announce yet another new version of the popular Sudoku program SuperDoku.

Version 1.09 extends the existing range of puzzles to include “comparison” puzzles, where you are given a blank grid with arrows to indicate which of two neighbouring values is the smaller.

Another new feature, requested by one of our users, is a “notepad” window where you can mark possibilities for squares yourself – a green alternative to paper, and a do-it-yourself alternative to the existing square analyser.

You can download it from

<http://www.sinenomine.freemove.co.uk/software>

ARMalayer version 0.60

ARMalayer version 0.60 is now available from <http://www.armclub.org.uk/free>
Enhancements and fixes since last release

- * Added support for ELF REL object files, and AR libraries of ELF objects.
- * Improved structure annotations in AOF/ALF chunk file formats.
- * Enhancement of both AOF/ALF and ELF/AR objects and libraries to label exported functions with their symbol names, and to annotate unlinked functions using relocation and symbol table information.
- * Text mode disassembly output of characters 128 to 159 replaced with dots to prevent formatting problems with some editors.

ARMalayer is an ARM code analyser that understands RISC OS and ELF executable, module, utility, object and library formats. It can output disassembler or ObjAsm compatible assembler styles, in plain text, fully hyperlinked and syntax coloured HTML, XML, or custom formats for import into Impression, TechWriter and Ovation Pro. It has extensive analysis features to detect problems that may be encountered when converting code to 32 bits, and to highlight performance issues on different ARM variants. The assembler output may be used as a basis to produce 32 bit versions of code where the sources are not available. It is available for RISC OS with a desktop front end, and command line versions for Win32, x86/32 and x86/64 Linux. Also included is a RISC OS version built with GCC and UnixLib which does not require the 32bit SCL. —

The ARM Club Free Software : <http://www.armclub.org.uk/free>
The 32 bit Conversion page : <http://www.quantumsoft.co.uk/druck>

NoButton 2.3

NoButton allows you to control some/most of the functions of a modern printer from your computer rather than press combinations of buttons on the printer. off' function of Canon printers in a more comprehensive way. NoButton is shareware

This version implements the 'Power <http://www.jochenlueg.freeuk.com>

Acorn User archive project

The first phase of the Acorn User archive project is now complete. The Acorn User web-site at www.acornuser.com now has a complete listing of all issues of Acorn User together with the front cover and a contents listing.

The project is being done by John Peachey and his team – and they have completed this first phase months earlier than expected. Many thanks to them.

Over the next few weeks we will start to add links to selections of the articles themselves. The original electronic versions of the articles no longer exist so only a very small selection of articles can be reproduced from the paper sources and we will be republishing some in an updated and re-edited form whilst others may be reproduced as images of the original page.

This phase of the project will take very much longer and will be an ongoing task – but to start it we are looking to you to say which of the articles and series from Acorn User you would like to see re-emerge. To start with we have identified:

histories of Acorn; reviews of significant items of hardware and software; general tutorials; programming using BBC BASIC, Assembler, C, and c.

If you would like to see any articles from Acorn User being made available on the web then please tell us which you would like to see – either in its original form or updated; it will take a great deal of work to reproduce the articles so we want to ensure that we include what many of you want. Please browse through the contents at www.acornuser.com and send your ideas to editor@qercus.com

We also invite suggestions for links to third-party sites. If the Acorn User contents refer to items that are still available (free or commercial), or that are described in other archive sites, then please send us details of the third party site and note where our link should start from. Links to the Acorn User site should simply use www.acornuser.com with the year and issue number to enable the user to simply locate the correct place.

Should you find any errors in the contents listings or links then please send details to editor@qercus.com

Assuming enough people show us that these archives are useful then we will try to find the resources to extend the project to archives from:

The Micro User / BBC Micro User / Acorn Computing Electron User Let's Compute A&B Computing / Archimedes World Acorn Publisher

The Acorn User archive project has been implemented by Qercus magazine as part of the celebrations of Acorn User's 25th anniversary. Later in 2007 we also intend to republish some of the Acorn User cover discs & CDs

NB If you would like to volunteer to help with any part of the project – mainly transcribing from image/text on paper, checking transcribed text, updating articles, and web design/site production – then please get in touch with us at editor@qercus.co

Bazound

'Bazound' is a small configuration and diagnostic utility for the RISC OS sound system. As well as the current value of configurable parameters (such as the sample rate) it shows the names and addresses of components registered with the SoundDMA module (such as the current 16 bit linear handler). It may be useful to programmers writing sound software, and in situations where programs have left the sound system in an indeterminate state.

Version 0.30 (24 Mar 2002), which can be downloaded from Acorn Arcade:

<http://starfighter.acornarcade.com/mysite/utilities.htm#bazound>

The 'Sound system components' window has been extended to show

which application (if any) currently claims ownership of the sound system. Every second whilst this window is open, Bazound broadcasts a DeviceClaim message for device 6.0 (the sound system). If another task replies with a DeviceInUse message then Bazound will display its name, task handle, and the returned information string.

'Bazound' was written using Joe Taylor's 'AppBasic', which simplifies the task of creating applications using only BASIC and the Toolbox.

Full source code is included in one of the archives, which may be of interest to anyone considering using 'AppBasic' themselves

CashBook 0.99 Released

Steve Fryatt writes - CashBook (version 0.99) is now available for download from my website. I'm hoping to make this the last beta before releasing a stable version 1.00, so I would be grateful for any feedback or bug reports that people can provide.

CashBook is a home accounts application, capable of tracking money through an unlimited number of bank, building society, credit card or other types of account. Income and expenditure can be allocated to analysis headings, which can be used for budgeting or reporting.

All transactions can be reconciled against statements, and real-time statement views are available to make the process easier to manage. Repeating transactions, such as standing orders, direct debits or salary payments, are fully supported with a look-ahead facility to help avoid nasty surprises.

An integral reporting system is included, which allows printouts of the various summaries to be printed out as well providing the raw data for use in a spreadsheet, graphing package or WP software.

Since the last release, CashBook has gained the following major new features in addition to minor tweaks and bug fixes:

- * The ability to sort the contents of the transaction window, statement views and standing order lists on any of the visible columns.
- * Highlighting of overdrawn accounts or over/under budget analysis headings in the account and heading list window. In statement views, overdrawn account balances can be highlighted and out-of-budget-period analysis heading entries can be shaded.
- * Full support for entering negative values throughout the package.

These features account for the most internally-complicated additions requested by those who used the first version of CashBook. Now that these are out of the way, the aim is to stabilise the application again for version 1.00 and then start to add the other requested features. Items on the wish-list so far are additional reporting options and improved file import facilities.

CashBook is freeware; more details, and a download, can be found at:
<http://www.stevefryatt.org.uk/software/cashbook/>

Dr Wimp New Release, Version 4.70

Version 4.70 of the freeware Dr Wimp package is now available at
<http://www.rayfavre.me.uk/drwimp.html>

This release mainly concentrates on extending the facilities for the management of menus & sub-menus. Extra parameters have been added to the three main 'user-functions' concerned with menus/sub-menus, giving the programmer a wider range of management options.

In addition, the existing 'wimp-functions' used for displaying/printing drawfiles have been extended to allow negative scale values to be accepted – thus allowing back-to-front and/or upside-down images. (This includes sprite objects in drawfiles but not JPEG objects.)

(Note: The Text-plotting 'wimp-functions' already allow negative scales but this was not previously stated in the documentation.)

All formats of the Dr Wimp Manual (Text, Impression Publisher, OvationPro and HTML) have, as usual, been updated accordingly and are also on the web-site. The Impression & Ovation formats show the text changes from the previous version in a separate colour.

Upgrading of existing applications using the previous Dr Wimp version is trivial.

Iconv 0.08

Version 0.08 of the Iconv module is now available for download. This is a recommended update for all users – new builds of NetSurf will require it.

New in this version:

- * Improve support for endian-specific Unicode variants (UTF-32{BE,LE}, UTF-16{BE,LE})
- * Add rudimentary transliteration support (activated via //TRANSLIT) – simply replaces unrepresentable characters with '?' for now.
- * Remove StubsG build as A9home now has a C99 capable C library.
- * Overhauled documentation

Fixed in this version:

- * Fix bug in 8bit writing which resulted in the remaining buffer size being reduced even if nothing was written.
- * Work around issue in UnicodeLib where remaining buffer size is reduced if an attempt is made to write an unrepresentable character (which results in nothing being written).
- * Handle ISO-8859-{1,2,9,10,15} more strictly, rather than attempting to use ISO-6937-2-25 style shift sequences.

Changed in this version:

- * Tightened up parameter checking in various places.
- * Improve hashing of encoding aliases (may result in minor speed increase)

<http://www.netsurf-browser.org/iconv/>

!LaBella

Version 6.20 (25th March 2007) adds two new options suggested by users.

The first is an option to add UK Postal barcodes – including the use of real Delivery Point Suffixes, if required. (Many thanks to David Pilling for giving permission to use and include the ‘PObar’ font supplied with OvationPro, designed by Kevin Simpson.)

The second is an option to clip text

to avoid it printing beyond a label edge. (This option cannot be used at the same time as the existing Wrap option.)

As usual, updated Text, Impression and Ovation Manuals are available for download

<http://www.rayfavre.me.uk/dwappps.html>

MoreDesk version 1.15

MoreDesk version 1.15 is now available to try or buy from the 7th software site.

<http://www.7thsoftware.com/moredesk/>>

The latest version includes many improvements and significant new features:

- * Desktop automation. You can associate windows, filer displays and applications with each desktop
- * The micro window view can contain an icon to indicate which task is present in each desktop
- * Iconising a window or selection of windows now behaves much better
- * Lots of improvements have been made to the help pages
- * Various other bug fixes and improvements

The full details of the changes in version 1.15 are available here:

<http://www.7thsoftware.com/moredesk/html/history.html>>

MoreDesk allows you to organise your windows on over a space which is larger than the normal desktop. It does this by creating a grid of desktop spaces and by allowing you to select which of these is the one you are currently looking at.

You can easily move windows between desktops and get a view of the entire desktop space. You can even have different sets of pinboard icons and a different backdrop image for each of the desktops. Events such as opening filer windows or launching applications can be associated with desktops.

MoreDesk costs just GBP 14.99 (plus VAT) and can be purchased on-line or by sending an order form to 7th software.

cmosd saves the CMOS on an A9home

cmosd is a little BASIC program, which checks every 30 seconds whether the CMOS has changed. If it has changed, then cmosd saves the CMOS in a file. At start of cmosd the file will load into the CMOS. So with an A9home you can save the CMOS after a reboot and do not need to save every change of the CMOS manually. If you want to use cmosd on a A9home, please first make sure that the program will run on your little computer before you let run cmosd at boot time. cmosd will run on RISC OS 3.1 and later.

Download cmosd from

<http://www.arcsite.de/hp/cms/esoftware.html#cmos>

MIDI and MIDISupport update

Alan Gibson writes - As part of the Liquid Silicon site updating (prior to a server move) I

have added a page detailing the current status of all the MIDI-related items which have been 32-bitted.

MIDI 5 and MIDISupport together provide modern drivers for older cards and new developments (e.g. USB), allowing for multiple connections between several interfaces and software applications simultaneously. For example MelIDI or Sibelius could play a MIDI keyboard externally and !MIDISynth internally at the same time.

For full details please visit www.liquid-silicon.com

Any comments on the new site design are welcome too, I'm trying to keep it fairly simple and uncluttered but it's got a way to go yet.

AsmPDP v1.07 PDP-11

AsmPDP is a PDP-11 assembler which will run on any platform capable of running BBC BASIC V, such as BBC ARM CoProcessor, RISC OS, DOS, Windows and Unix. AsmPDP is also available as a precompiled executable for DOS/Windows.

Version 1.07 implements the 'ADR label,dst' pseudo-opcode to calculate the absolute address of a location in a position- independant manner as an offset from the program counter.

AsmPDP is available at

<http://mdfs.net/Software/PDP11/Assembler>

For up to the minute

RISC OS news visit

DROBE

www.drobe.co.uk

Free for All

Andy Burgess

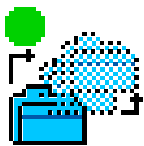
nOver – only for non 32bit machines – i.e. old ones!

<http://www.quantumsoft.co.uk/nover/>

Preparing the article for last issue, I succeeded(!) in overwriting my text file on Cashbook with a Paint file called the same name. Instantly my prose for that software had disappeared, and hence my article wasn't published and you haven't seen it! This accidental overwriting I always considered a failing on RISCOS, but thought it was my ignorance of the OS rather than an actual fault.

No so, unfortunately! I contacted my friend Paul Vigay (of Orpheus) for advice. He told me that a few people had commented on the lack of this facility on RISC OS. He also gave me a link to a piece of software called NOver (no-overwrite) which works on RISCOS3 and ROS4, it's not 32bit compatible.

NOver will check for existing files before overwriting, and will "alert you before the file is overwritten". It can also store a "copy of any file about to be overwritten and place a copy in a special backup directory so you wouldn't lose the original!"



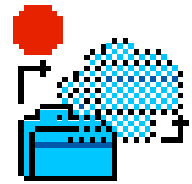
Green blob

The green blob means it is working! If you right (adjust) click – you toggle it on (green blob) and off (red blob). I followed the instructions in the "Read1st" file included with nOver. On attempting to overwrite the example file – I got the following dialogue:

Do you wish to overwrite this file?:Text1
with options of:

OK & learn / No / and Overwrite (the default)

It's fairly self explanatory what the options will give you – “OK & Learn” will add to the !nOver.ignore file which tells the program which overwrites it doesn't need to prompt you for. You can get at the “ignore” file, by menu clicking and choosing “Ignore...” If you accidentally click “OK & Learn”, then you can get into inadvertent overwriting territory again. To undo this – remove the relevant line from !nOver.ignore. Then it will check again!



Red blob

Another advantage it gave me was modifying this document and resaving it also gave me the “Do you wish to overwrite this file?” dialogue – a la Windoze – at last.

Further to this, nOver also keeps backups of the files you've chosen to be overwritten – so you have a safety copy of your masterly prose. It can also be turned off by menu-clicking “Options...” and unticking “Back up overwritten files” option from the task bar.

The backed up files are stored in <Wimp\$ScrapDir>.nOver by default, and are stored by time within date. The date directory is of the form “2007Feb01”, and the sub directories are within time order. A bit wierd the naming of these with com mans, but quite logical nonetheless. A file overwritten at 14:13 could have a directory name of “14,13,1529”. within this directory is the actual file before it was replaced. If you had multiple versions of the same file, it would probably be wise using something like Gerald Hartmann's FileFind (reviewed previously) or whatever to locate all of them.

The Read1st file described something about putting the nOver directory in somewhere in the !Boot, but the directory structure didn't exist on my machine – probably because I've got the Universal (now standard) !Boot structure, and this program from 1998 is too old?

Anyway, I ignored these instructions, and I added the program to my very own “runprogs” obey file that resides in !boot.choices.boot.tasks, with the following command line:

```
Filer_Run ADFS:$.nOver.!nOver
```

Now it would rerun after a reboot.

An excellent piece of software, but what am I going to use when I upgrade away from my A7000? If I ever manage to!



Letters to the editor

From Jeremy C B Nicoll by email

I think you summed up the contact problem quite accurately.

But - in a world where we can post a question/comment on a newsgroup or mailing-list, and get an immediate response, why would anyone want to write to Eureka and ask a question when a response - if there's one at all - will arrive months later?

TBH, although I realise the magazine is probably a matter of pride to the ARM Club, and this comment must sound ungrateful, I think it's become redundant. The reason I joined the club was simply because I thought it might be a good idea, and that - perhaps - it might allow me to pay a very small amount towards the cost of the free software I've downloaded from the club, which is available to all, as far as I know. In any case I've no idea if the money goes anywhere near the author(s). Probably the money mainly pays for Eureka.

Living in Edinburgh it's hardly likely that I'll meet other members, especially as poor health prevents me going to shows. OTOH if I went to a show I don't think being a club member would bring me any benefit. The benefits of membership list on the back of the mag suggests that discounts are available to members, but I'm not sure that I've ever seen one described anywhere, and even if I did the chance of it being for something I was about to purchase is quite small.

Advice/support is available through the csa newsgroups, and is independent of the club.

-- Jeremy C B Nicoll - my opinions are my own.
(Well what does the rest of the membership think -Ed)

RISC OS User Group of London

On 21st May, Martin Wuerthner will give a talk and demonstration at ROUGOL.

Martin's current RISC OS projects include development of ArtWorks, EasiWriter, TechWriter, and Gimp-Print/Gutenprint for RISC OS.

ROUGOL meetings take place on the third Monday evening of every month, upstairs at The Blue-Eyed Maid Public House, 173 Borough High Street, London SE1 1HR, starting at 7:45pm. Meetings benefit from video projection, wireless broadband internet access, and a bar and restaurant. Admittance is free.

RISC OS User Group of London, info@rougol.jellybaby.net

RISC OS Computer Show Wakefield '07



Saturday, 19th May 2007

The Mill House and Frobisher Suite
Stanley Ferry Marina, Ferry Lane, Stanley, Wakefield
West Yorkshire WF3 4LT

The North's premier RISC OS show, including:

- Small Developer Community Area
- Charity Stall
- On-site catering (including pub food)
- Disabled access

(Charity Stall fundraising for Wakefield Hospice)

Details and Prices

- **Date** Saturday, 19th May 2007
 - **Opening time** 10.30am to 5.00pm
 - **Ticket price** £4 on the door
- Entry for children aged 6 or under (accompanied by an adult) is **FREE**

Enquiries

- Wakefield Show 2007, c/o 3 Riverdale Avenue, Stanley, Wakefield, WF3 4LF
- show2007info@wakefieldshow.org.uk

For further details, visit

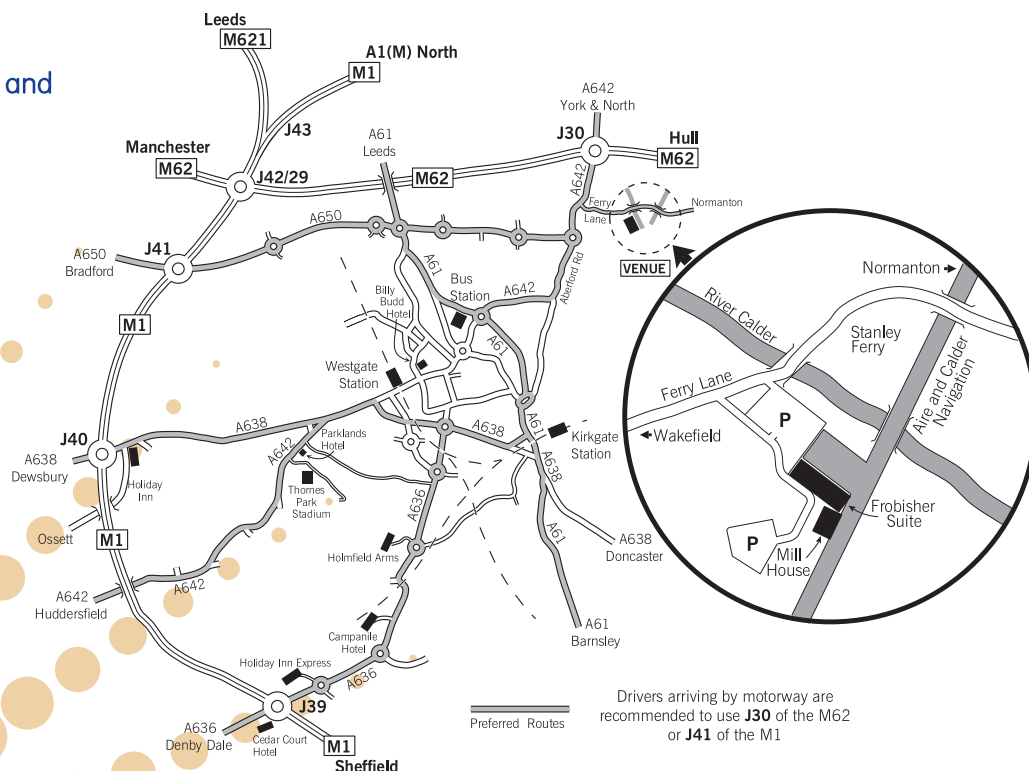
<http://www.wakefieldshow.org.uk/>

Getting there by car

- Easy access from **M1**, **M62** and major routes
- Look out for the AA signs
- Free on-site parking

Getting there by train

- Free minibus serving **Wakefield Westgate** station, with connections across the UK



Drivers arriving by motorway are recommended to use **J30** of the M62 or **J41** of the M1

Sponsors



APDL



SW Show Pics

Photos by David Ruck

Orpheus Internet



Bell ringing



R-Comp Interactive



Louie Smith of RISC OS Now



Castle



Pretty Shapes



The Ron Briscoe Column

I'm Still Here.

If you lot are reading this, then you have clearly not paid any attention to our esteemed editors pleas for more article submissions. So all of the pain that my drivel inflicts on you is your fault and you will have to endure more of the same until he is able to say. "Sorry Ron but your rubbish falls well below the standard expected for inclusion in Eureka. So have it back!" Get writing now!

As reported in my last load of poo I went to the Weston Show, again transported by the kindly Doug Webb and we had a very enjoyable time spending cash and meeting fellow RISC OS people. As the redoubtable Martin Weurthner had done no upgrades for ArtWorks or EasyWriter, due to being busy on more lucrative work, I had to be satisfied with parting with a paltry amount for upgrading GimpPrint to GuttenPrint.

Why paltry? Well as well as being a not inconsiderable piece of work in itself, Martin has spent a lot of effort and time ironing out various problems we users found. All with his usual good humour and patience. RISC OS developers, don't you just love them?

Just before the show Martin revealed that he was going on a skiing holiday and my heart stopped. It is too late to organise a keep Martin safe from harm on the ski slopes party so I bite my nails till news arrives of his safe return. All RISC OS software developers should be kept in a safe place, obviously in unaccustomed luxury, taking no risky adventures. As there was no software upgrades to pay for, not even RComp, I had to buy new stuff. Well to me anyway. I am always amazed how people on the stands demonstrate their wares with so much ease. David Snells assistant was demonstrating ProCAD+ to

gasps of amazed appreciation from interested parties. In a quieter moment I asked him what he did for a living, expecting some form of CAD CAM wizardry and was astounded to be told that he worked for the Civil Service. Just goes to show how good RISC OS software is. I now have ProCAD+ and RiscCAD and damn good they both are.

Remembering Christine I purchased at great expense, well a tenner, a CD sized jigsaw and a very interesting CD entitled 'Gazetteer of Bell Towers in the Oxford Diocese, 125th Anniversary edition.' from the Fortran Friends stand. No! The 125th anniversary is not the length of time Fortran Friends has been going. The Jigsaw is double sided, albeit that the picture is the same on both sides. So Christine had twice the pleasure of doing it.

Perambulating round I keep bumping into fellow MUG Club members, two who have been there from the previous evening, one who even sent a gloating email from the hotel. I visit the ARM Club stand and enjoy a bit of banter with the committee, refusing Ralph's kind offer to sell me old software that won't run on my Iyonix and if it is anything like the previous piece of software I bought from him will not run on anything. He did tempt me with a Psion 5c with lots of add ons but I was strong. 'Biggles' Ruck tells me he has flown down and a mental picture passes through my head of his Usenet adversaries hastily erecting anti-aircraft batteries in preparation for his journey home. I personally think that given Drucks experience with his Satnav device at a previous Weston Show and that he is doing the navigation for the journey back, it would all be a waste of time, as he will probably end up in Glasgow.

Pausing for a chat in, what is for him, a quiet period to Dave Holden I toy with the idea of trying out a cunning wheeze on him. Good sense prevails however for Dave is to wily a bird to be caught and besides he is bigger than me. Already owning most of his wares and not being in the slightest bit interested in knowing what criminal stock I am descended from I regretfully pass up the chance of the 32 bitted and much improved Ancestor+ and seeing paying customers hovering into view, move on.

Pausing at the Neil Spellings stand, not in great hope, as I

already have AemularPro and Geminus, my eyes catch sight of a graphics card. "Is it suitable for my Iyonix?" I ask "Yes!" Neil says and adds "It runs without needing a fan." The words are hardly out of his mouth when I hear a familiar voice say. "If it runs silently then I can replace my present graphics card which is a bit noisy for me." Yes it is John Rickman, he who at Wakefield, if you recall, bought a stonking big monitor because he could hear a high pitched whine from his existing one. Luckily there are two cards so we can both have one.

Throughout the day I have only caught fleeting glimpses of Doug as unlike me, who goes to shows to spend money and have a little chat here and there, Doug also likes to go to the theatre presentations. However I notice that he still finds time to spend monies on good things and is carrying so many bags that he is in danger of having his arms extended.

At the end of the show, which is as always excellently organised and run by John Stonier and his gang of ever cheerful helpers, Doug has a headache. This I am assured is not due to me as we have hardly seen each other all day. I volunteer to go and fetch him some Asprin from the local village shop whilst he sits and sorts his purchases out.

Off I trundle the half mile or so to the shop leaving him sitting in the bar/restaurant. Yes my friends you have guessed, once again the unpaved countryside has it in for me and the shop is closed. I trundle back empty handed. In the meantime Doug has had something to eat and feeling much better is chatting to yet another MUG member.

We say our goodbyes and set off home and on the way Doug switches on the car radio so we can listen to the football results. After much tuning Doug gets Five Live and the first things we hear are "This is the worst performance I have ever seen from an away side." the score is then given "Hull 2 Birmingham 0." the car wobbles, I check that my door is securely fastened and that my seat belt is secure. I wonder if Doug has fitted an ejector seat a la James Bond but decide not as he wouldn't wish to ruin his car roof by thrusting my head through it.

During the intervening period I have recruited, or rather reminded an old, as in past, ARM Club member that he had

allowed his membership to lapse and he has since sent off the cheque. Do I get any commission?

Who is this man with more money than sense....Step forward Dr Peter Young, would be instigator of the 'politeness' on Usenet pseudo-campaign, pedant and all round nice guy. (Leave the money in the usual place please Peter.) During an exchange of emails about various things Peter informed me that he had never been to a RISC OS show and has a liking for single malts. Well I personally think he was that mysterious visitor to the ARM Club Show who left after a few minutes when he found that the bar did not sell malt whisky. (That canard is what he gets for refusing to accept my kind offer to send him at least one of my old Eureka articles.) Since Weston we have of course heard the news that the Wakefield Show is on and at a new venue this year. I am sure that my fellow WROCC members will do their best to make our day there a good one and the only one not doing any work will be more than pleased to help you test the adjoining bar facilities, ie me.

Those of you who read Archive-on-Line will have seen my pathetic attempts to raise money by prodding my ex WROCC chairman into winning me a bet in which I failed. However all was not lost for on the very next Sunday I managed to more than recoup my losses.

I may have told you in the past that Christine is fond of going to the Birmingham Botanical Gardens and so most Sundays we make a leisurely stroll around the gardens after which I pay for a meal. Now this particular Sunday the B.B.G. had a days entertainment called a touch of the Caribbean part of which a food tasting. I encourage Christine to taste everything on offer. This of course means that she has no appetite for her usual lunch.

Another cunning plan comes good.



After the SW Show

David Ruck

It was one of the Flying Schools Flyaways where all the planes fly off somewhere with a mix of qualified PPLs sharing the flying and navigating each way, and also some instructors accompanying students. This time we were intending to fly to Nottingham, with the option of Leicester if the weather wasn't too good.

Which it wasn't, with fingers of low cloud and showers moving down the country from the north. We knew something was up when we heard a helicopter going in the same direction radioing in to say it was turning back – and they can fly at walking speed and hedgerow height in thick fog if necessary, but she obviously didn't fancy a few showers this time. We were made of sterner stuff, and as I flying the outbound leg I wasn't going to give up, so was constantly weaving and dodging round the impenetrable grey sheets of clouds, and scraping under low clouds.

Some of the visual flying rules had to be slightly bent; such as 3km visibility (which we had in some directions, not necessarily forward), remaining visible with the ground at all times (just not always directly below when flying over small clouds) and minimum safety altitudes (we were pretty sure we weren't anywhere near the huge masts at Rugby, but a lot of people wouldn't be watching TV that night if we were). My co-pilot Alan did mention he'd have turned back if he'd been flying, which I think might have been a hint, but I was too busy for subtleties.

Nevertheless it came as a bit of a relief when Al the school owner in the fast Cessna 177 (having taken off last, but whizzed past us 152's in the air) radioed our onroute controller that he was going to divert in to Leicester instead of pressing on to Nottingham, and to let us know. We'd all heard and were

breathing a sigh of relief at the prospect of getting out of sky at this point. Luckily our planned route took us right over Leicester airfield, and it was easy to find – for all except my old instructor Andy and his student who having taking off first had missed most of the showers and was coming in to Nottingham, and last heard of heading off for a curry.

The bloke manning the radio at Leicester (its not a full air traffic control airport)



suggested we do an overhead join, which involves flying over the airfield at 2000ft then descending in to the circuit at 1000ft to fly round before coming in to land. I had to decline that offer as at 1300ft I was banging my head on the clouds. I found myself slotting in to the circuit with a plane coming in to land just below to the left and another coming up behind.

While concentrating on giving him plenty of room, I suddenly went in to a thick clump of low cloud and was in total white out. I had no choice but to dive left and descend out of it. I popped out just behind the landing plane, but I wasn't too worried about that, I knew where he was going, I just hopped the one behind was avoiding me as I suddenly reappeared. I then flew along side the other plane as he descended on to the runway, and I maintained height to do another circuit. Then after all the drama I put it down perfectly, which was nice.

Leicester has a good restaurant, and I had a huge and very nice portion of gammon steak, egg and chips – what the hell I was navigating on the way back. It looked a lot clearer when we took off, but after a few minutes we came across a complete wall of showers rather than the patches we could nip round on the way

in. It looked like turning back conditions for sure this time, and we started contemplating the prospect of getting a taxi home from Leicester. We could just see the glisten of Dracott Water ahead and then nothing but greyness, but I urged Alan to fly as far as the lake as there was no danger in descending to below the clouds there,



as long as we stayed above the mast height of the few yachts still out on the water. Luckily as we went over the lake the green of fields beyond started to show through, so we were able to get back up and on course. The showers remained out of our way rest of the trip, clinging to the Cotswold ridge line which we paralleled all the way back, and Alan set us down gently back at Staverton.

Flyaways in nice sunny conditions are all very well pleasant, but that sort atrocious condition is what builds real character. It does show you the benefit of getting an instrument rating though, as then you can fly through the clouds and even get above all the muck, so I'm starting saving my pennies for that course now.



Some more pictures at

All photos by D. Ruck

<http://www.druck.plus.com/Flying/Leicester/>

Winning games with logic

part 17

Barry Aulton

I have to admit I was going to write about something else and then found I hadn't finished the fuzzy logic stuff; so if this is a bit on the bland side you can always make another coffee!

That said Fuzzy logic is one of the most common techniques in use in game AI; its main advantage to the game industry is enabling game testers to control the game logic without having to add hard coded logic. This is particularly useful since the standard of programming has probably declined. Steve Pratt posted this on the net in Jan 2007:-

"I've been in this business since back when it was called EDP, and I must say that the level of competence and even common sense has declined to the point where most of them can't code their way out of a paper bag!

For example: a new application had been up for 30 days. Programming staff called me to complain about their passwords expiring. I pointed out that all passwords are expired every 30 days.

The users had been calling the help desk to get their passwords reset.

The programming staff complained that the help desk should not expire passwords immediately when a password is reset since the users could not figure out how to change their own passwords. After some while I asked the programmer " Does your application allow the users to change their passwords?" He replied "Not Yet," "

OK on with the FUZZ

You can imagine what an unholy mess you get when you add yet more hard coded IF - THEN - ELSE sort of stuff to code that already has too much of it! Far better to put in the factors that you think are reasonable from the vague statements the game testers make about how they think the AI should work and get them to keep juggling with game parameters until it works. This is rather like giving a cook a vague recipe for making a cake, plus the ingredients and getting him/her to make adjustments. The first few cakes will probably taste awful, but hopefully things will improve with time.

One way of reducing the problem is to write a simple expert system to reproduce human like intuition on a computer. Intuition may seem like a human trick, but machines can be pretty good at it, too. Underlying a hunch are dozens of tiny, subconscious rules - truths we've learned from experience e.g. by playing the game. Add them up and you get instinct. Program these rules into a computer and you get an expert system. Many small systems now exist that bring a narrow slice of in-depth knowledge to a specific problem. For example Wedding Planner from Organizers for Us contains rules for etiquette e.g. Rule *** = " This is not the time for your mother in law jokes". The system asks basic questions and e.g. produces the wording for the invite. (Unfortunately the one I was sent for my niece's wedding was in Hebrew and not much help.)

You may have spotted a snag: you can't keep interrupting a computer game to ask questions; you can however play the game against the initially stupid computer player(s). In certain places in the game you may note that if the main player is making his character(s) do one thing, it may be a good idea for the opposing characters to do something to counteract that (e.g. if the main character is swimming opposing players should attempt to cut him off). You end up with several rough rules of thumb that ordinarily could not be used in a computer program due to the difficulty of quantifying them, e.g. what does 'NEAR' mean. You would also probably find that if you applied > 20 rules strictly, the ad-hoc (expert) system you have devised would not work well. However, an expert system for a computer game may consist of hundreds of such rules, some using ad hoc functions. Fuzzy logic offers a way of combining those rules to make them work together.

The Fuzzy Set YOUNG

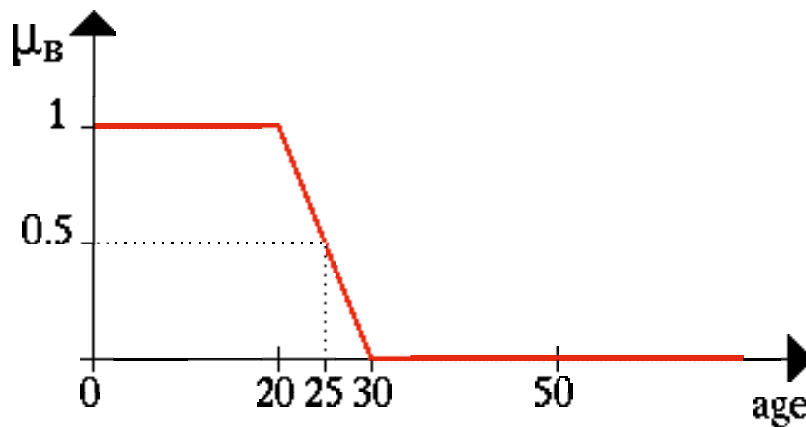


FIG 2

All situations involving conflicting data, personal preferences or subjective judgments may exhibit this difficulty.

Suppose you must choose a restaurant for an evening out with friends. Your selection will weigh multiple factors (some known only subjectively) including price, location, and your knowledge of your friends' ethnic food preferences and dietary restrictions. To formulate this problem for an expert system you could allow a different degree of desirability to each restaurant and assign multiple values to attributes such as cost of food, distance to travel, food preferences etc. that are inputs to your decision process. You could then ask your friends to rate the restaurants for each attribute.

The goal for an expert system to 'solve' this problem being to choose the restaurant which the system has assigned the greatest confidence (desirability) level, subject to your input set of rules.



McDonalds it is then, the food's crap but we're broke!

In a fuzzy logic system to solve this problem we may have rules such as:-

AS the restaurant is NEAR and the food is

CHEAP

and the restaurants * rating is HIGH

THEN the restaurants desirability is HIGH

By constructing an expert system you are making the code more data driven which in turn reduces the need to keep tampering with it. But how do you construct a rule for a fuzzy expert system. Firstly we construct the fuzzy sets. I hope you have got the idea of how to construct fuzzy sets now, but in case you haven't let us construct one more set, namely the set YOUNG. (fig. 2)

To describe the set of young people, we can denote $B = \{\text{set of young people}\}$. Since age usually starts at 0, the lower range of this set is clear. The upper range however is rather hard to define. The question arises: why is somebody on his/her 20th birthday say young and next year not young? A natural way to construct the set B would be to relax the strict separation between young and not young. This can be done by allowing more flexible phrases like Well, he/she belongs a little bit more to the set of young people or NO, he/she belongs nearly not to the set of young people. FIG 2 shows a fuzzy set (membership function) YOUNG.

Of course, membership functions are all very fine and dandy, but just what can we do with them? Well for a start let us link fuzzy sets to make rules: for example

AS the temperature is LOW and the person is YOUNG

THEN the decision to travel by car is MEDIUM.

With this rule we are linking a whole fuzzy set "LOW", to another fuzzy set "YOUNG" and are assigning it to a fuzzy set MEDIUM - which shows how much of a good idea it is to travel by car when the decision is around 50 - 50.

But how do you apply such a rule and what does and mean here?

There have been other expert systems that attempt to cope with uncertainty. The MYCIN inference engine, developed by Shortliffe in 1976, originally for diagnosing a patient's infectious disease given his conditions is one such. The innovation in Mycin was that it was known that some rules were more

reliable than others. Thus each rule was given a 'certainty or reliability factor' indicating how reliable it was. Mycin reasons as to how these certainty factors should be combined to affect our belief in the consequent. When combining such rules these certainty or reliability factors are taken into account. For instance the rule

IF it flies THEN it is a bird we may somewhat arbitrarily give a certainty factor of say 0.9, allowing for bats, flying fish etc.

Although a full expert system like MYCIN is not often used in game programming (depending on the game, e.g. turn based games could use it), some of the ideas MYCIN uses can be applied in an add-hoc manner in a simple decision making process.

MYCIN informed itself about particular cases of bacterial infection by requesting information about a patient's symptoms, general condition, history and the results of any easily and quickly obtained tests. It asked questions in the course of applying a rule when it does not know the truth value of a formula in the rule and asks the doctor to supply it. Once it had identified the offending organism and satisfied the doctor that its' reasoning was sound Mycin went on to recommend an effective treatment. At each point, the question MYCIN asks is determined by MYCIN's current hypothesis and the answers to all previous questions. Thus the questions start as if they are a checklist i.e. the patients age, sex, history (when symptoms first appeared), but they then vary as the evidence builds up as a result of previous answers and the results of tests that Mycin suggests. Mycin uses ~500 rules for medical diagnosis to produce as many diagnoses as possible, each with an associated probability, e.g.

probability the patient has a cold = 70%

probability patient has flu = 20%

probability further tests for a possible more serious disease
needed = 10%

Mycin uses rules such as if we do this test on the patient and get this result then organism 'X' is present. By reasoning backwards a doctor may answer questions such as :- why should I perform such a test on this patient. Answer, because it would help to determine if organism 'X' is present.

A particular rule in Mycin may have several parts e.g.

IF the patient has spots

and the patient has a high fever

THEN there is a say 0.7 certainty that the patient has measles.

This rule has two hypotheses in the IF bits of the rule:-

1) the patient may have spots.

2) the patient may have a high fever.

The doctor will not be sure that each hypothesis is true and could in a particular case assign a belief say $MB[h1] = 0.9$ to the 1st hypothesis and $MB[h2] = 0.8$ to the second.

Here we have 2 hypothesis to combine ?

1) Patient has spots, 2) Patient has high fever.

We need to ask given this what is our belief that the patient has both spots and high fever.

In fact if we use the word truth instead of certainty MYCIN used the same interpretations of the and and OR operators as Fuzzy Logic

The most common definitions in fuzzy logic being:

$\text{truth}(\text{not } x) = 1.0 - \text{truth}(x)$

$\text{truth}(x \text{ and } y) = \text{minimum}(\text{truth}(x), \text{truth}(y))$

$\text{truth}(x \text{ or } y) = \text{maximum}(\text{truth}(x), \text{truth}(y))$

You may notice that this differs from the calculation you would make using probability theory; but is intuitive; for example suppose Jack is VERY TALL and VERY HEAVY
THEN JACK is VERY (TALL and HEAVY)

Similarly the formulas MYCIN uses for the conjunction (OR) and the disjunction (and) of 2 hypothesis are

$MB[h1 \text{ and } h2] = \text{minimum} (MB[h1], MB[h2])$

where $MB[h1]$ is an estimate of the degree of belief in hypothesis $h1$ (that condition x causes symptom Y)

We thus have a degree of belief $\text{minimum}(0.9, 0.8) = 0.8$ that the patient has spots and high fever.

$MB[h1 \text{ or } h2] = \text{maximum} (MB[h1], MB[h2])$

This notion of combining beliefs or truth values is often used in ad-hoc rule based systems for computer games. Your program may decide that the player is gathering a large army and is heading for your base camp, but how large is large and how certain is it that the player is not planning something else?

What you can do is assign a belief, certainty or truth value to each hypothesis e.g. 1) Army is large 2) Army is heading for computer player's base camp. and combine them by taking the minimum to provide your belief (truth value) that the base camp, will be attacked.

One of the big problems of using the Mycin system was it made the assumption that all rules were independent and relied on human expertise to construct such a rulebase. Unfortunately the presence of spots and fever are not independent events. A fuzzy expert system makes no such assumptions.

Fig 3 shows the fuzzy inference process. The inputs to the system are real values which we fuzzify by determining the degree of truth of each rules premise.

for example take the rule

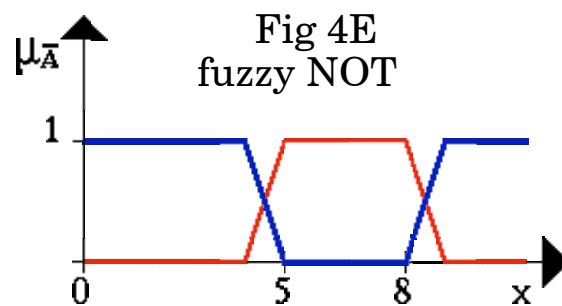
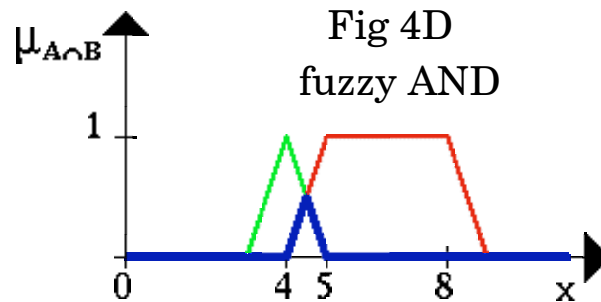
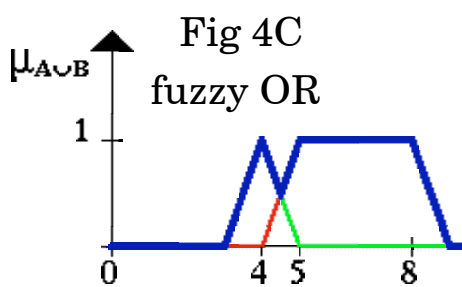
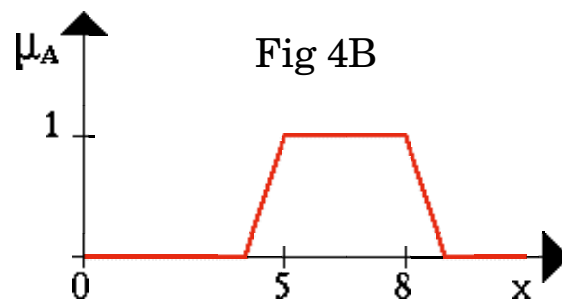
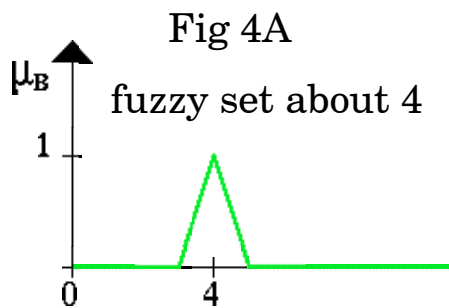
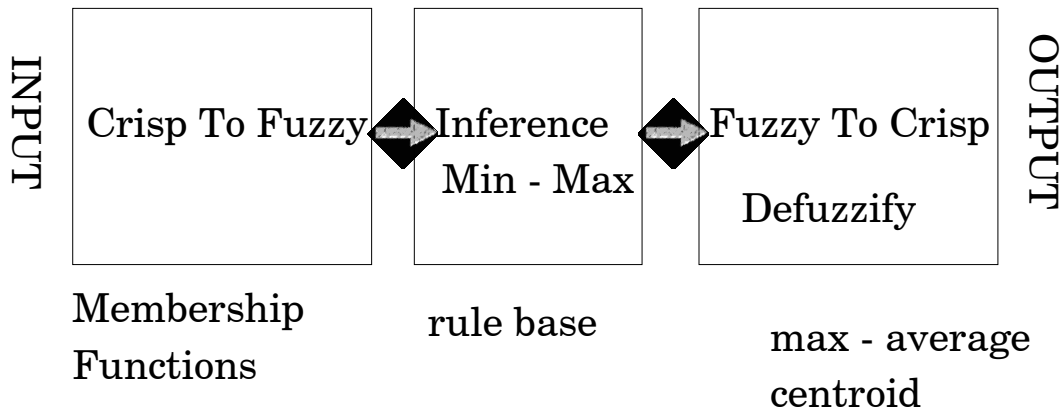
AS the temperature is LOW and the person is YOUNG
THEN the decision to travel by car is MEDIUM.

Suppose actually the person is 27. Looking at Fig 2 , it gives a rough truth value of say ~ 0.3 . Suppose the temperature is freezing. Taking the minimum of the two truth values $\text{minimum}(0.3 , 1.0) = 0.3$, you can see that this rule only partially applies. Again this differs from Boolean logic where a rule either applies or it doesn't. In fuzzy logic all the rules apply to some extent unless you choose to ignore rules whose computed truth values are small, (e.g. the truth value of the above rules is only 0.3.)

Figs 4A and B show fuzzy sets for about 4 and about 5 - 8.

Suppose you were asking the question how far can he jump. One person may say about 4m, another 5 - 8 m. Fig 4C, shows

Fig 3 - A Typical Fuzzy system



the fuzzy OR process showing the truth values obtained if either person was correct. Here the jumper may be able to jump anywhere from 3 to > 8 m. Fig 4D shows the fuzzy and process. If both people were reasonably correct in their estimates, we are only left with a region of 4 - 5 m. Finally Fig 4E shows the fuzzy not operator on the fuzzy set of Fig 4B, where the region 5 - 8m gives a truth value of 0. Suppose the jumper is only 4 years old. You may decide that (s)he can probably not jump 5 - 8m.

Suppose you wish your BADDIE to jump from one rooftop to another. If say Fig 4C represented its maximum jump distance you can use a look up table based on Fig 4C to select a randomised jump distance.

Sometimes it is useful to convert the output to a crisp number as in Fig 3 defuzzify. There are many ways of doing this, more next time.

Fuzzy logic is a useful technique for game programmers, enabling just the data to be tweaked, rather than keep changing code. It is used to change player behaviour in sports, fighting and battle games, and any AI decision making process.

AI game programmers, tend to have a rough time of it, usually because the manager often starts asking "Is it done yet?", sometimes holding a schedule for the next game. That said, graphics programmers don't get it all their own way. This is the start of the you know you are in trouble page:-

"This page began when we were all in the office late one night trying desperately to get a demo for our Playstation game done before the customer showed up. It was late, we were all tired, and then as we were driving around the database (it was a tank game) we came around a ridge and saw - the face of Jesus Christ on the side of a mountain! Nobody put it there, someone then said "Wow, you know your game is in trouble when Jesus appears in your texture maps".

Eureka CD Offer... £10.00

Post free

On the CD you get:

- *Every issue of Eureka to date.*
- *With illustrations in full colour...*

...as you've never seen them before.

- *A complete index to help you find anything you want.*
- *Plus the contents of all the magazine discs.*
- *And a bonus of extra software previously sold by the Club.*

Order now, post free, from:
CD Offer, The ARM Club, Merton Court, 38 Knoll Road,
Sidcup, Kent DA14 4QU

Send your queries, whether technical or elementary, to our

Technical Help Service,

by email to

support@armclub.org.uk

or write to the club's Merton Court address

(which you can find on the last page)

or fax 07020 954018.

If it's urgent you can phone

07010 708098.

(Phone and fax are at higher rates.)

Articles required for Eureka

Remember that everyone who contributes an article to the magazine will have their membership extended, free of charge, for every issue in which their work appears.

If you feel like writing an article or even a series then get in touch with the editor at:

eureka@wyvers.co.uk

or eureka@armclub.org.uk

Copy date for next issue of Eureka is the 1st of July

Club contacts

Email:

General queries	info@armclub.org.uk
Membership queries	membership@armclub.org.uk
Members' technical help	support@armclub.org.uk
Product sales	sales@armclub.org.uk
Magazine	eureka@armclub.org.uk
Software	products@amclub.org.uk

The ARM Club, Merton Court, 38 Knoll Road
Sidcup, Kent DA14 4QU

Telephone (higher rates):

General queries 07010 709849
Technical help line 07010 708098

Fax: 07020 954018

Web site: <http://www.armclub.org.uk/>

Published by The ARM Club

Chairman and Technical Support Co-ordinator: David Ruck

Membership Secretary: Toby Smith

Treasurer: Simon Burrows

Secretary: Chris Price

Product Development & Internet Officer: Tom Hughes

Show Organisation, Product Sales & Eureka Distribution: Ralph Sillett

Special Projects: Mark Smith

Technical Support: Matthew Cook

Editor: Andrew Wyver

© 2006 The ARM Club. All rights reserved