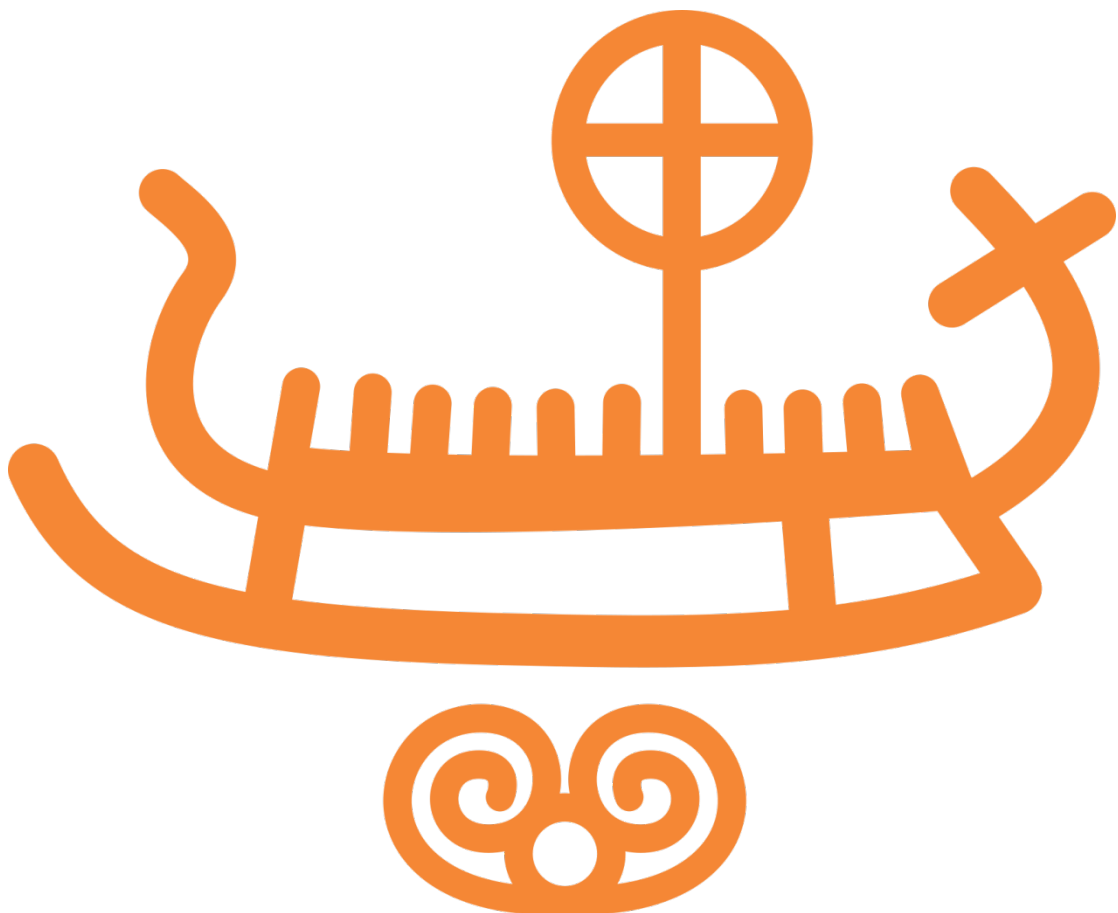


 #dyalog17

DYALOG

Elsinore 2017

Programme for Dyalog '17



Sunday 10 September – Thursday 14 September 2017





Welcome to the Dyalog User Meeting 2017 in Elsinore

All the presentation/workshop materials will be available on the Dyalog '17 webpage at <http://www.dyalog.com/user-meetings/dyalog17.htm>.

As usual, we will be recording and publishing as many presentations as we can (as a presenter you will always have the opportunity to review the recording and approve publication). We would like to ask for your help in ensuring that question and answer sessions are also recorded; you can help by only asking questions from the microphone podium.

If your question cannot wait until the Q&A session that concludes each presentation, or if the presenter specifically states that questions are welcome throughout, then please make your way to the microphone podium. Please do not ask questions from your seat as the recording cannot pick them up (and often people in the auditorium cannot hear them either).

Naturally, everyone from Dyalog Ltd will be happy to answer questions relating to their topics at any time during the user meeting.

For practical information, see the back cover

If you have any questions not related to APL, please ask Karen.



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A Message from Dyalog's CEO

I bid you a warm welcome to our annual user meeting and back to my favourite conference site, Konventum in Elsinore.

At Dyalog we always look forward to these five days of training, presentations and direct encounters with our users, where we can tell you what we have done, what we have in the pipeline and not the least catch up on what you have been up to since we last met!

You might have noticed that we have been more active with respect to live content on the web this last year and we will continue to build that presence in the future. We are still convinced, however, that nothing beats the personal meeting of so many of us when it comes to inspiring that one good idea or insight that will be of importance to you or your organisation in the future.

We wish you a good user meeting, some serious networking and hopefully some fun.

Gitte Christensen

Team Dyalog at Dyalog '17

This year, Dyalog Ltd is represented by 20 members of the current team. Meet Team Dyalog at <http://www.dyalog.com/meet-team-dyalog.htm>.

The Dyalog forums (<http://forums.dyalog.com/>) are regularly visited by Dyalog Ltd staff as well as other stalwarts of the Dyalog community and are a great place to ask questions and share your expertise.



Your Feedback

We want to ensure that our user meetings meet (if not exceed!) your expectations, and your feedback is critical to this. The new approach we took to collecting feedback last year greatly increased the amount we received, so we'll be repeating it this year. This means that:

- Each workshop will have its own feedback form, given out at that workshop.
- Feedback forms on the presentations will be distributed each morning and will only cover the presentations given that day.
- Feedback on the venue, facilities, social aspects, etc. can be given at any time at the Dyalog desk in the main reception area.

Please do take the time to let us know your thoughts on Dyalog '17 – what you like, what you find most interesting, suggestions for improvements, whether changes we've made this year as a result of last year's feedback have been successful, etc. – so that we can take these into account when planning future user meetings.

Thank you

Follow us on:

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- LinkedIn (<https://www.linkedin.com/company/dyalog-ltd->)
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Useful Dyalog e-mail addresses:

- usermeeting@dyalog.com
any user meeting-related issues, both technical and non-technical
- sales@dyalog.com
any non-technical questions related to Dyalog, for example, pricing information or licence purchase (not user meeting-specific)
- support@dyalog.com
any technical questions concerning Dyalog (not user meeting-specific)



Birds-of-a-Feather Discussion Groups

A Birds-of-a-Feather session is an open, face-to-face conversation with fellow user meeting attendees. It is not a presentation or lecture (there is no projector and there are no slides) or a problem-fixing session but rather a discussion, and provides the opportunity to find and engage with others who share your interest in a subject area.

Each Birds-of-a-Feather session has a host who gets the discussion started and keeps it moving around the group. The host is not the person with all the answers (or all the questions). Asking questions, offering answers, exploring possibilities and sharing opinions is everyone's job!

We're offering three of these discussion groups on Monday evening. Those interested in participating should meet their host in the bar at 20:30.

The discussion topics on offer, and the hosts for those topics, will be announced on Monday morning.



Schedule: Sunday 10 September

08:30 – 09:30	Registration (Dyalog desk in main reception area)
09:30 – 13:00 tea and coffee available throughout	<p>Workshops</p> <p>(SA1) Processing non-APL Data Files Room B24 Richard Smith and Michael Baas</p> <p>(SA2) Services and Multi-Process Applications Room C13 Morten Kromberg and Bjørn Christensen</p> <p>(SA3) Performance Tuning Room B10 Roger Hui, Marshall Lochbaum and Jay Foad</p> <p>(SA4) SharpPlot Room B38 Nicolas Delcros</p>
13:00 – 14:00	LUNCH Restaurant
14:00 – 17:30 tea and coffee available throughout	<p>Workshops</p> <p>(SP1) Dyalog Version 16.0 Language Features in Depth Room C13 John Scholes, Richard Smith and Roger Hui</p> <p>(SP3) Co-dfns Compiler: Hands-on GPU programming with APL Room B24 Aaron Hsu</p>



17:30 – 19:00	Free time
19:00 – 20:30	DINNER Restaurant
20:30 –	INFORMAL GATHERING Bar (cash bar) Includes brief presentations from Ray Cannon and Morten Kromberg on the PiRatBot and DyaLegoBot respectively, followed by a demonstration of how one/both of them perform in a maze and an opportunity to play with some of Ray's other components.

For workshop abstracts, see pages 15-18.

NOTES:



Schedule: Monday 11 September

All presentations take place in *Damgårdsalen*.

08:30 – 09:00	Registration (Dyalog desk in main reception area)
09:00 – 09:30	(D01) Welcome to Dyalog '16 Gitte Christensen, Managing Director (CEO)
09:30 – 10:00	(D02) Technical Road Map: The User Experience Morten Kromberg, User Experience Director (CXO)
10:00 – 10:30	(D03) Technical Road Map: Under The Covers Jay Foad, Technical Manager (CTO)
10:30 – 11:00	TEA/COFFEE
11:00 – 12:00	(U01) Patterns and Anti-patterns in APL: Escaping the Beginner's Plateau Aaron Hsu (Indiana University)
12:00 – 13:00	LUNCH Restaurant
13:00 – 13:30	(D04) A Case Study – Recoding from Procedural to Denotative Style John Scholes
13:30 – 14:00	(D05) APL Source Code in Text Files Morten Kromberg
14:00 – 14:30	TEA/COFFEE
14:30 – 15:00	(D06) Py 'n' APL Marinus Oosters (Dyalog intern – summer 2017)
15:00 – 15:30	(U02) RIDE 4.0 and 4.1 Callum Floume (Optima Systems) and Gilgamesh Athoraya (Data Analytics AB)
15:30 – 16:00	TEA/COFFEE
16:00 – 16:30	(D07) Index-Of on Multiple Floats Roger Hui



16:30 – 17:00	(U03) Working with APL for Physics Research Kostas Blekos (University of Patras)
17:00 – 19:00	Free time
19:00 – 20:30	DINNER Restaurant
20:30 –	INFORMAL GATHERING Bar (cash bar) Includes Birds-of-a-Feather Discussion Groups Meet your chosen topic's host in the bar (see page 4)

For Dyalog presentation abstracts see pages 19-22.

For user presentation abstracts see pages 23-27.

NOTES:



Schedule: Tuesday 12 September

All presentations take place in *Damgårdsalen*.

09:00 – 09:30	(D08) Moving Bits Faster in Dyalog 16.0 Marshall Lochbaum
09:30 – 10:00	(U04) APL on GPUs – A Progress Report with a Touch of Machine Learning Martin Elsmann (University of Copenhagen)
10:00 – 10:40	(U05) Co-dfns Report 2017: Ease of Use, Reliability and Features Aaron Hsu (Indiana University)
10:40 – 11:00	TEA/COFFEE
11:00 – 11:30	(U06) Parallel Execution in a Monolith Application Lars Villadsen (SimCorp)
11:30 – 12:00	(U07) Freedom Hunting: Our Search for Independence in UI Design Annalisa Camillo (SimCorp Italiana)
12:00 – 13:00	LUNCH Restaurant
13:00 – 13:30	(D09) Cross-Platform User Interfaces using the HTMLRenderer Brian Becker
13:30 – 14:00	(D10) Tolerant Unique Roger Hui
14:00 – 14:30	(D11) Literal Notation for Arrays and Namespaces Adám Brudzewsky
14:30 – 15:00	TEA/COFFEE
15:00 – 15:30	(U08) APL in SA: The Joys of Financial Reporting and Creating Libraries for Everyday Use Zack Batik (RiskFlow)



15:30 – 16:00	(U09) Exploring the RF spectrum with Dyalog APL Moris Zucca (SimCorp Italiana)
16:00 – 16:30	(D12) Try APL Online Brian Becker and Adám Brudzewsky
16:30 – 19:00	Free time
19:00 – 20:30	DINNER Restaurant
20:30 –	Free time

For Dyalog presentation abstracts see pages 19-22.
For user presentation abstracts see pages 23-27.

NOTES:



Schedule: Wednesday 13 September

All presentations take place in *Damgårdsalen*.

09:00 – 09:30	(U10) Managing Projects That Never End Alexey Miroshnikov (InfoStroy Ltd)
09:30 – 10:00	(D13) UNMOVE and Other Predictions for Dyalog Version 17.0 Richard Smith
10:00 – 10:30	(D14) Uncle Andy's Fireside Chat v4.0 Andy Shiers
10:30 – 11:00	TEA/COFFEE
11:00 – 11:30	(U11) Polyominoes in APL John Niss Hansen
11:30 – 12:00	(U12) Evolutionary Programming Gilgamesh Athoraya (Data Analytics AB)
12:00 – 13:00	LUNCH Restaurant
13:00 – 13:15	(U13a) Problem Solving Contest Prize Ceremony Brian Becker
13:15 – 13:45	(U13b) How I Won the Problem Solving Contest Kostas Blekos (University of Patras)
14:00 – 17:00	Viking Challenge Meet in main reception area at 13:55. Wear outdoor clothes and comfortable shoes.
17:00 – 18:30	Free time
18:30 – 19:00	PRE-PRANDIAL DRINKS Bar next to Salonerne
19:00 –	BANQUET Salonerne



For Dyalog presentation abstracts see pages 19-22.

For user presentation abstracts see pages see pages 23-27.

NOTES:



Schedule: Thursday 14 September

All presentations take place in the *Jorns Auditorium*.

09:45 – 10:15	(D15) TAO – Total Array Ordering Roger Hui
10:15 – 10:45	(D16) User Command Developments Michael Baas and Adám Brudzewsky
10:45 – 11:15	TEA/COFFEE
11:15 – 11:45	(D17) Prefix Agreement: A Proposal for an Extension to the @ Operator John Scholes
11:45 – 12:15	Open Forum and Closing Session Team Dyalog
12:15 – 13:15	LUNCH Restaurant
13:15 – 16:45 tea and coffee available throughout	Workshops (TP1) A Tale of Two Web Apps Room B10 Brian Becker and Michael Baas (TP2) Cloud Deployment Room B38 Morten Kromberg and Andy Shiers (TP3) Code Golf Hackathon Room B21 Roger Hui, Marshall Lochbaum, Jay Foad and Adám Brudzewsky (TP4) Mobile Development Discussion Room B24 John Daintree



For Dyalog presentation abstracts see pages 19-22.
For workshop abstracts, see pages 15-18.

NOTES:



Abstracts: Workshops

These workshops have significant time set aside for participants to experiment with the subject matter.

Some of the workshops require materials that should be installed on your laptop before attending. These pre-requisites are listed by workshop at dyalog.com/user-meetings/dyalog17/workshops.htm. Please ensure that you meet these pre-requisites before attending a workshop if at all possible.

SA1: Processing non-APL Data Files

Sunday 09:30 – 13:00

Richard Smith and Michael Baas

In this workshop we will import and export various forms of data encoded in text files and process their content; along the way there'll be tips and tricks and a few interesting diversions. Then we will look in-depth at importing and exporting data in native Excel (.xls and .xlsx) files.

SA2: Services and Multi-Process Applications

Sunday 09:30 – 13:00

Morten Kromberg and Bjørn Christensen

In this workshop you will learn about tools for starting and managing multiple processes.

Keywords: Conga, APLProcess, RPCServer, Futures and Isolates, Windows Services and UNIX daemons.

SA3: Performance Tuning

Sunday 09:30 – 13:00

Roger Hui, Marshall Lochbaum and Jay Foad

The gurus are back with another round of tips and tricks aimed at making your code run faster – with special focus on features recently added to Dyalog.

**SA4: SharpPlot**

Sunday 09:30 – 13:00

Nicolas Delcros

Bring your own data to an introduction to SharpPlot and SharpLeaf, the graphics and publication tools that are included with Dyalog on all platforms.

SP1: Dyalog Version 16.0 Language Features in Depth

Sunday 14:00 – 17:30

John Scholes, Richard Smith and Roger Hui

A review of the new primitive language features of Dyalog version 16.0 by the people who designed and implemented many of them.

SP3: Co-dfns Compiler: Hands-on GPU Programming with APL

Sunday 14:00 – 17:30

Aaron Hsu (Indiana University)

This workshop will take you from zero to a completely working Co-dfns compiler installation, show you how to use the compiler, how to optimise your own programs, how to debug Co-dfns performance and execution errors, how to understand the process of running APL programs on the GPU and how to get some extra flash out of your code.

Bring your own code to the workshop if you would like to experiment with running it on the GPU – we'll have a number of example programs to work with, but we also want to provide space for anyone who wants to make their own code run fast.

TP1: A Tale of Two Web Apps

Thursday 14:00 – 17:30

Brian Becker and Michael Baas

How do you build an APL-based web application?

In this workshop, Brian and Michael present the design and implementation of two production MiServer applications – TryAPL.org and the Dyalog Event Registration System.



Topics that will be covered include (but are not limited to):

- Scalability using distributed processing
- Using N-tiered architecture separating user interface, business logic, and database access
- Interfacing with 3rd party web services (for example, payment processors)
- Managing user state and sessions
- Consistent and Responsive Look and Feel
- Deployment and Continuous Integration for High Availability

NOTE: This workshop focuses on high level design and implementation. Brian and Michael do not plan to cover the basics of MiServer – members of the APL Tools Group will be available through the week to discuss MiServer and any other APL Tools related questions.

TP2: Cloud Deployment

Thursday 14:00 – 17:30

Morten Kromberg and Andy Shiers

Bring your own small application and at the end of this workshop you should have it up and running under Amazon Web Services and/or Microsoft Azure. Includes an introduction to running under Linux for Windows users, RIDE, and a few words about service authentication using certificates.

TP3: Code Golf Hackathon

Thursday 14:00 – 17:30

Roger Hui, Marshall Lochbaum, Jay Foad and Adám Brudzewsky

Join us for a light-hearted but deadly serious session of code golf – the art of writing the shortest code possible. Our problems are chosen to encourage use of recently added language features. You will exercise your own skills and collaborate with the entire group on the challenges posed. After an introduction to the code golf community, you may find yourself spending more time in it than your manager might like!



TP4: Mobile Development Discussion

Thursday 14:00 – 17:30

John Daintree

An informal discussion about how mobile development with Dyalog could be done. Starting from [last year's "Airfix" model](#), John leads a conversation around what's good, what's bad, and where we want to be.



Abstracts: Dyalog Presentations

D01: Welcome to Dyalog '17

Gitte Christensen, Managing Director (CEO)

Dyalog Ltd's CEO opens the user meeting.

D02: Technical Road Map: The User Experience

Morten Kromberg, User Experience Director (CXO)

Morten presents his view of the currents that APL users will need to navigate in the years to come, and the steps that Dyalog is taking to make the journey a pleasant experience.

D03: Technical Road Map: Under The Covers

Jay Foad, Technical Manager (CTO)

Jay discusses technical achievements in the latest version of Dyalog APL, new projects targeting the next release, and priorities for the engineering team for the next few years.

D04: A Case Study – Recoding from Procedural to Denotative Style

John Scholes

The procedural and denotative mindsets are quite different. John hopes to highlight those differences by stepping through the translation of one style into the other.

D05: APL Source Code in Text Files

Morten Kromberg

Most new work on APL code distributed with Dyalog APL is now based on open-source repositories, and version 16.0 includes the source for many new tools as text files which have been copied from these repositories. Morten talks about why we are doing this, how to find and load – and contribute to – the new code, and finally discusses ideas that Dyalog is working on that will allow you to easily build and test applications based on text source.



D06: Py 'n' APL

Marinus Oosters (intern, summer 2017)

Python is a popular programming language with some similarities to APL. An interface between the two would enable APL programmers to benefit from being able to call libraries written in Python, and Python users could take advantage of APL to do analyses that are difficult to code or perform poorly in Python. Marinus, one of the winners of the 2016 Dyalog Problem Solving Competition, was an intern at Dyalog in July and August of 2017, and spent this time developing a Python-APL interface – Py 'n' APL.

D07: Index-Of on Multiple Floats

Roger Hui

Roger presents an efficient computation for $x \uparrow y$. The solution makes key use of the new interval index ($\underline{\uparrow}$) primitive, and the relatively new key operator ($\underline{\uparrow}$) elucidates the classical hashing algorithm.

D08: Moving Bits Faster in Dyalog 16.0

Marshall Lochbaum

Dyalog version 16.0 features some big improvements to functions that move Boolean values around, like Reverse, Rotate, Catenate, Expand/Compress and Transpose. Marshall shares some of the secrets that make Dyalog's new versions of these primitives so fast, in particular the many tricks needed to make transposing a Boolean matrix efficient for every possible shape.

D09: Cross-Platform User Interfaces using the HTMLRenderer

Brian Becker

The HTMLRenderer is a new tool for building user interfaces that can be displayed by Dyalog version 16.0 under Microsoft Windows, Linux and macOS. In a series of brief demos, Brian shows how it can be used to build a confirmation prompt, a simple data entry form, display some graphics – or run an existing MiServer application.



D10: Tolerant Unique

Roger Hui

Unique (`⍷`) with non-zero `⍵CT` is incorrectly implemented in all but one of the APLs and APL dialects that has the primitive. Roger analyses how the error came about and describes a solution (and a speed-up). He also proposes that unique be extended to higher-ranked arrays.

D11: Literal Notation for Arrays and Namespaces

Adám Brudzewsky

New primitives and system functions are frequently added to Dyalog APL, but extensions to the syntax of the language are rare. Adám proposes a notation for arrays and namespaces that allows definitions to be spread over multiple lines.

D12: Try APL Online

Brian Becker and Adám Brudzewsky

How do you make it easy to introduce people to APL?

Adám and Brian talk about two websites, TryAPL.org and tio.run, that allow a user with no more than a browser to use Dyalog APL online.

D13: `⍵NMOVE` and Other Predictions for Dyalog Version 17.0

Richard Smith

New native file functions were introduced in Dyalog version 15.0 to allow simple and portable access to the host file system. More are coming, and Richard will attempt to predict what they will be.

D14: Uncle Andy's Fireside Chat v4

Andy Shiers

Andy once again takes a look at some of the less-well announced features of Dyalog APL. He mainly concentrates on features within Dyalog version 16.0, but might mention other versions (past and future!).



D15: TAO – Total Array Ordering

Roger Hui

(Work done in conjunction with John Scholes)

The extension to τ makes it possible to "find anything". Roger proposes that \uparrow (and \downarrow) should be extended so that it can be used to "sort anything". The extension also enhances the usefulness of the new interval index ($\underline{\iota}$) primitive.

D16: User Command Developments

Michael Baas and Adám Brudzewsky

Dyalog's user command system is under constant development. Michael and Adám demonstrate the latest additions and show how they can simplify your work. They also describe what they are currently working on to make your APL development experience even better.

D17: Prefix Agreement: A Proposal for an Extension to the @ Operator

John Scholes

The right operand of the @ operator *can* be a Boolean-returning selection function. In this case, the shape of the resulting mask must match that of @'s right argument. This extension investigates allowing lower-rank masks to conform, for example, a Boolean vector result could select rows of a matrix.



Abstracts: User Presentations

U01: Patterns and Anti-patterns in APL: Escaping the Beginner's Plateau

Aaron Hsu, Indiana University (U.S.A.)

Writing good, efficient, maintainable APL code that maximises the value of APL's design elements does not appear to coincide with traditional best practices of software engineering commonly taught at the University level of Computer Science education. This is readily apparent in the early competency plateau that new array programmers experience after they "get the basics". While learning to write good code is the journey of a lifetime no matter what language you write in, escaping a beginner's competency in order to really understand, manipulate, and work with advanced APL programs that exhibit all the classic qualities of "beauty" ascribed to famous APL one-liners can be better understood and facilitated by addressing the disparity between best practices in APL code and best practices as they are understood in traditional Computer Science curricula.

Understanding what makes good APL code, why this matters and how it differs from writing good code in other languages can have wide-ranging benefits. Code reviews can become more targeted, coding styles can be written in a more APL-friendly way, on-boarding beginner APL developers can be accelerated and explaining APL code to sceptical non-APLers can rely less on hand waving and appeals to nebulous, ill-defined concepts.

U02: RIDE 4.0 and 4.1

Gilgamesh Athoraya, Data Analytics AB (Sweden) and Callum Floume, Optima Systems (U.K.)

RIDE 4.0 was released simultaneously with Dyalog version 16.0. Gil and Callum review the most important features of the new version, and speculate about what might be in RIDE 4.1.

U03: Working with APL for Physics Research

Kostas Blekos, University of Patras (Greece)

Kostas describes his experience of using APL to produce a research paper on "model making and numerical computing".



U04: APL on GPUs – A Progress Report with a Touch of Machine Learning

Martin Elsmann, University of Copenhagen (Denmark)

(Work done in conjunction with Troels Henriksen and Cosmin E. Oancea)

Martin presents a status report of the APL→TAIL→Futhark compiler, which compiles a subset of APL into code executable on GPUs. The compiler handles quite a number of APL functions and operators and is, for the subset of APL it supports, highly compatible with code written for Dyalog APL. As well as reporting on the performance of a number of APL benchmarks, he demonstrates, by example, how the APL compiler tool chain can be used to efficiently teach a neural network to recognise handwritten digits.

U05: Co-dfns Report 2017: Ease of Use, Reliability and Features

Aaron Hsu, Indiana University (U.S.A.)

The Co-dfns compiler has made significant strides to improve usability, reliability and the feature completeness of the compiler – in this talk Aaron focuses on the status of feature-completeness and improvements to the installation, configuration and usage. He gives specific instruction on understanding errors and debugging issues with the compiler as well as providing a set of guidelines for writing high-performance APL code with Co-dfns, explaining how the performance model of parallel computation differs from the performance model of the interpreter when writing code. This will help anyone who is writing Co-dfns programs to understand how to optimise code to best run on the compiler.

Time permitting, a bit of flashy demo time might also be in the works!

U06: Parallel Execution in a Monolith Application

Lars Villadsen, SimCorp (Denmark)

Assuming that you have all the time in the world and no customers then you would probably be able to get your application designed to run in parallel fashion with well-defined components and clear interfaces between components – but what do you do when this assumption does not hold?

Lars gives an introduction to the way in which SimCorp tries to utilise the power of the modern PC HW and use more than one CPU and still work within the boundaries set by a 25-year-old application.



U07: Freedom Hunting: Our Search for Independence in UI Design

Annalisa Camillo, SimCorp Italiana (Italy)

Over a few decades, our application (SOFIA) has run on different operating systems, moved from one APL interpreter to another, and experienced dramatic changes in user input/output technologies. We have worked hard to abstract our designs from hardware contexts, to free screen design from rigid bonds, and to dream up adaptive screens using a dynamic approach.

U08: APL in SA: The Joys of Financial Reporting and Creating Libraries for Everyday Use

Zack Batik, RiskFlow (South Africa)

Banking in Southern Africa has a heavy focus on regulatory reporting. Reading substantial amounts of data, doing a little bucketing and some simple sums is the game. After writing three import routines in three months or manually exporting 100 .dills in a day it becomes apparent that there must be a better way.

Having generalised tools to handle common tasks allows for more time spent on the interesting side of coding. Furthermore, having access to open source tools and libraries has become the norm for most popular languages but is not as readily available in APL. Zack discusses the motivation for, and application behind, several open source tools that he has developed.

U09: Exploring the RF Spectrum with Dyalog APL

Moris Zucca, SimCorp Italiana (Italy)

In the last decade, low cost devices capable of receiving raw data in a wide range of frequencies have become commonly available on the market. Software Defined Radios (SDR) are now widespread, replacing components that are traditionally implemented in hardware with software. Moris explains how it is possible to connect the Dyalog APL interpreter to those devices and to receive and convert the radio signals using APL.



U10: Managing Projects That Never End

Alexey Miroshnikov, InfoStroy Ltd (Russia)

For many years, we were a small team with deep insight into subjects we had worked on together for a very long time, and minimal internal communication requirements. As we added less experienced team members and the number of parallel projects grew, we realised that we needed tools to help us manage our work – but "traditional" project management tools didn't feel very comfortable.

This is the story of how Alexey discovered the JIRA framework from Atlassian and came to understand that Agile project management was exactly what he was looking for.

U11: Polyominoes in APL

John Niss Hansen (Denmark)

In 2 dimensions, a polyomino is a plane geometric figure formed by joining one or more congruent squares edge to edge; in 3 dimensions, cubes are used instead of squares and joined side by side. In this talk, John discusses multi-dimensional polyominoes, and why APL is a good tool for not only enumerating and visualising polyominoes, but also for creating and solving puzzles in 0-4 dimensions, where polyominoes are used as pieces.

U12: Evolutionary Programming

Gilgamesh Athoraya, Data Analytics AB (Sweden)

Nature is beautiful and complex, so it is not surprising to see so many attempts at mimicking nature when looking for a solution to a problem. Artificial neural networks have been successfully implemented to interpret images and other signals.

Evolutionary and Genetic Programming is using the principals of biological evolution to find a solution to a problem. A population of genetic code evolves through generations of reproduction and mutation until an individual is produced that is particularly fit for the problem at hand.

Gilgamesh presents a study of Evolutionary Programming using function trains as chromosomes and isolates to parallelise the evolution of the perfect train.



U13a: How I Won the APL Problem Solving Contest – Introduction and Prize Ceremony

Brian Becker

The ninth annual International APL Problem Solving Competition took place earlier this year. Brian introduces the contest and grand prize winner, culminating in the award ceremony.

U13b: How I Won the APL Problem Solving Contest

Kostas Blekos, University of Patras (Greece)

Kostas Blekos is the grand prize winner of the ninth annual International APL Problem Solving Competition. Following the award ceremony, Kostas describes his experiences of APL/Dyalog and tells us how he managed to master enough of it to win the competition.

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Practical Information

To make your stay as pleasant as possible, we would like to draw your attention to some practical details.

Check In and Out

You will need to check out of the room by **09:00** on the day of departure.

Internet Access

Free WiFi is available in all areas. The WiFi network is *Konventum* or *2G Konventum* (changes with location in the building). There is a PC-café in the main building with PCs and printers available for use by all delegates.

Meals and Drinks

The user meeting fee includes all meals and breaks on user meeting days.

- Breakfast is from 07:00-09:00 (Monday to Friday) and 07:30-10:00 (weekend)
- The lunch buffet includes a soft drink.
- Beverages are not provided with dinner but can be purchased from the bar.
- Wine is included with the Banquet Dinner.

There are no tea/coffee making facilities in the bedrooms but self-service tea/coffee and iced water is always available in the main building (guests can enter all night with their key card).

Hotel Facilities

All rooms have a TV, a desk, a hairdryer and an en-suite bathroom with shower.

The hotel has a Fitness Centre on site with a fully equipped gym and sauna – it is free to use, always open and accessed with your room key card. There are also pool tables, table tennis and other activities available free of charge; please ask at the hotel reception for details.

There is a bar near the restaurant that is open from 10:00 and closes at the end of the day...when the bar downstairs opens. The downstairs bar stays open until approximately midnight (exact time depends on sales). Please remember to settle your bar bill when you check out!

Smoking Policy

Smoking is only permitted in the dedicated smoking areas (clearly marked).