DYALOG

Elsinore 2023

Programme for Dyalog '23

Sunday 15 October – Thursday 19 October 2023

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

A Message from Dyalog's CEO

It is my pleasure to welcome you all to our annual user meeting and to Konventum in Elsinore.

We look forward to sharing what we have been up to, our plans for the future, and hearing about your latest achievements either through presentations or face to face.

Dyalog Ltd has grown a lot over the last couple of years, and we look forward to introducing you to our staff, new as well as old hands. We respect the importance of our software to many of your organisations, and we truly believe that the personal meeting between you and our staff members will be beneficial to our future co-operation.

We wish you a good user meeting, and hope you will enjoy yourself. Most importantly, we hope that you will leave Denmark with a renewed network, insight, and inspiration that will make a difference to you and your organisation in the year(s) to come!

Gitte Christensen

Team Dyalog at Dyalog '23

This year, Dyalog Ltd is represented by 24 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.

Useful Dyalog e-mail addresses:
- sales@dyalog.com – any non-technical questions related to Dyalog, for example, pricing information or licence purchase
- support@dyalog.com – any technical questions concerning Dyalog

About Dyalog '23

Materials from the presentations and workshop will be available on the Dyalog '23 webpage at http://www.dyalog.com/user-meetings/dyalog23.htm after the user meeting.

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).

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

Viking Challenge

The Viking Challenge this year is an indoor, problem solving, challenge. No special clothing or equipment is required. Please don't bring a laptop, just an alert mind!

Meet in *Damgårdsalen* at 15:00 (Wednesday 18 October).

Schedule: Sunday 15 October

08:30 – 09:30	Registration (Dyalog desk in main reception area)
09:30 – 13:00 tea and coffee available throughout	Workshops **(SA1) Project Management using Link, Cider, and Tatin (Part 1 of 2)** *Room B21* Morten Kromberg, Kai Jaeger, & Gilgamesh Athoraya **(SA2) Tacit Techniques** *Room C13* Adám Brudzewsky & Rich Park (asst. Peter Mikkelsen) **(SA3) Applied Performance Challenge** *Room B24* Karta Kooner & Aaron Hsu
13:00 – 14:00	**LUNCH** *Restaurant*
14:00 – 17:30 tea and coffee available throughout	Workshops **(SP1) Project Management using Link, Cider, and Tatin (Part 2 of 2)** *Room B21* Gilgamesh Athoraya, Kai Jaeger, and Morten Kromberg **(SP2) Development Masterclass** *Room C13* Adám Brudzewsky & Stefan Kruger (asst. John Daintree) **(SP3) Providing and Using Web Services** *Room B24* Brian Becker (asst. Rich Park & Josh David)

| 17:30 – 19:00 | Free time |
| 19:00 – 20:00 | **DINNER**
Restaurant |

For workshop abstracts, see pages 14-18.

NOTES:

Schedule: Monday 16 October

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 '23** Gitte Christensen, Managing Director (CEO)
09:30 – 10:15	**(D02) The Road Ahead** Morten Kromberg, Technical Director (CTO)
10:15 – 10:45	**(D03) Dyalog Version 20.0 – Part 1** John Daintree
10:45 – 11:15	TEA/COFFEE
11:15 – 11:45	**(D04) Setting and Getting Variable Values** Adám Brudzewsky
11:45 – 12:15	**(D05) Revisiting `⎕SH` and `⎕CMD`** Peter Mikkelsen
12:15 – 13:15	**LUNCH** *Restaurant*
13:15 – 14:00	**(D06) An Introduction to the Workspace** Richard Smith
14:00 – 14:30	**(D07) Future Performance Improvements in Set Functions** Karta Kooner
14:30 – 14:45	BREAK
14:45 – 15:15	**(U01) APL Worker Bees – Another Way to Run APL Tasks in Parallel** Stig Nielsen (SimCorp)

15:15 – 15:45	**(U02) Transforming and Streamlining a Complex Development Process using Dyalog** Mark Wolfson (BIG)
15:45 – 16:15	TEA/COFFEE
16:15 – 16:45	**(U03) The Evolution of APLTree and APL-cation** Kai Jaeger (independent)
16:45 – 17:15	**(D08) Using Packages** Morten Kromberg
17:15 – 19:00	Free time
19:00 – 20:00	**DINNER** *Restaurant*
20:00 –	**(U04) Music: APL vs APS (A Pointy Stick)** Ray Cannon (independent)

For Dyalog presentation abstracts see pages 19-23.
For user presentation abstracts see pages 24-28.

NOTES:

Schedule: Tuesday 17 October

All presentations take place in *Damgårdsalen*

09:00 – 09:30	**(D09) Dyalog Tools Update** Brian Becker
09:30 – 10:00	**(U05) Converting a COM Server to a Jarvis-based Web Service** Finn Flug (Dittrich & Partner Consulting GmbH)
10:00 – 10:30	**(D10) Running Dyalog on ARM64 Machines** Ron Murray
10:30 – 11:00	TEA/COFFEE
11:00 – 11:30	**(U06) Dyalog, AWS, Jarvis, Docker…What's Not to Like?** Claus Madsen (FinE Analytics)
11:30 – 12:00	**(U07) Once Upon A File** Elena Paviotti and Gianna Folladore (SimCorp Italiana)
12:00 – 13:00	**LUNCH** *Restaurant*
13:00 – 13:30	**(U08) quAPL – A Quantum Computing Library in APL** Marcos Frenkel (NCSA/University of Illinois at Urbana-Champaign)
13:30 – 14:00	**(U09) APL and Metallurgy** Jesús Galán López (Ghent University)
14:00 – 14:30	**(U10) Teaching Linear Algebra with APL** Asher Harvey-Smith (University of Warwick)
14:30 – 14:45	BREAK
14:45 – 15:15	**(D11) Dyalog + Kafka = True?** **Stefan Kruger**

15:15 – 15:45	**(D12) Dyalog Version 20.0 – Part 2** John Daintree
15:45 – 16:15	TEA/COFFEE
16:15 – 16:45	**(D13) Giving Key a Vocabulary** Adám Brudzewsky
16:45 – 17:15	**(D14) The Return of Uncle Andy's Fireside Chat** Andy Shiers
17:15 – 19:00	Free time
19:00 – 20:00	**DINNER** *Restaurant*

20:00 –	**"Birds of a Feather" discussion groups:**
	• **Language Enhancement Speculation**
	  host: Adám Brudzewsky
	• **.NET**
	  host: John Daintree
	• **Ride and Dyalog on macOS**
	  host: Stefan Kruger and Gilgamesh Athoraya
	Bar

NOTES:

Schedule: Wednesday 18 October

All presentations take place in *Damgårdsalen*

09:00 – 09:30	**(D15) Co-dfns Update 2023** Aaron Hsu
09:30 – 10:00	**(U11) A YAML Parser in APL – Leveraging a Linear Dataflow Model to Unleash APL's Expressiveness** Brandon Wilson (Effective Altruism)
10:00 – 10:30	**(D16) Statistical Libraries for Dyalog** Josh David
10:30 – 11:00	TEA/COFFEE
11:00 – 11:30	**(U12) Grain Growth and Array Programming** Jesús Galán López (Ghent University)
11:30 – 11:50	**(D17) How I Won the APL Problem Solving Competition – Introduction and Prize Ceremony** Brian Becker
11:50 – 12:15	**(U13) How I Won the APL Problem Solving Competition (Professional Winner)** Alexander Block (Viridium Insurance Group)
12:15 – 13:00	**(U14) How I Won the APL Problem Solving Competition (Student Winner)** Andrea Piseri (Università degli Studi di Milano)
13:00 – 14:00	**LUNCH** *Restaurant*
14:00 – 15:00	Free time
15:00 – 17:00	**VIKING CHALLENGE** Meet in *Damgårdsalen* at 15:00 No special clothing or equipment required

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 19-23.
For user presentation abstracts see pages see pages 24-28.

NOTES:

Schedule: Thursday 19 October

All presentations take place in *Damgårdsalen*

09:30 – 10:00	**(U15) Introspections of an Intermediate APLer – The Good, Bad, and Ugly of Learning APL** Brandon Wilson (Effective Altruism)
10:00 – 10:30	**(U16) An Implementation of APL Array Notation** Kamila Szewczyk (Saarland University)
10:30 – 11:00	TEA/COFFEE
11:00 – 11:30	**(D18) Vega Charts with Dyalog** Rich Park
11:30 – 12:00	**(D19) Dyalog Licensing** Jada Andrade
12:00 – 12:30	**(D20) Dyalog Ltd – Behind The Scenes** Stine Kromberg
12:30 – 13:30	**LUNCH** *Restaurant*
13:30 – 17:00 tea and coffee available throughout	Workshops **(TP1) Testing APL Systems** *Room B21* Morten Kromberg, Michael Baas, & Stefan Kruger **(TP2) Leading Axis Theory and Practice** *Room C13* Rich Park & Adám Brudzewsky **(TP3) APL Functions to Import, Export, and Process Data in Files** *Room B24* Richard Smith & Peter Mikkelsen

For Dyalog presentation abstracts see pages 19-23.
For workshop abstracts, see pages 14-18.

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 https://www.dyalog.com/user-meeting/dyalog23/workshops/prerequisites.htm. Please ensure that you meet these pre-requisites before attending a workshop if at all possible.

SA1: Project Management using Link, Cider, and Tatin (Part 1 of 2)
Sunday 09:30 – 13:00
Morten Kromberg, Kai Jaeger, and Gilgamesh Athoraya

Recent versions of Dyalog include *Link*, which makes it easy to use a folder containing text files as the source of your APL code, rather than a binary workspace. That might be all you need for really simple applications, but it doesn't take long before you want to have dependencies on code from other projects – or *Tatin* packages – to complete your application. You might also want to have tests and development tools that are in your source folder(s) but not delivered to end users. These additional features are the domain of a project management system like *Cider*.

This workshop provides an introduction to using Cider (which is included with Dyalog version 19.0) to manage Dyalog APL projects.

If you are interested in making your work available to other users in the form of a package, or simply want to understand how packages are created, you can continue with second part of the workshop on publishing packages using Tatin (SP1).

Keywords: project management, Tatin, Cider, Link

SA2: Tacit Techniques
Sunday 09:30 – 13:00
Adám Brudzewsky and Rich Park (asst. Peter Mikkelsen)

Are you intrigued or confused by the growing prevalence of tacit APL code (trains and compositional operators)? If so, this workshop is for you! We'll help you to spot relevant patterns, guide you in using appropriate tacit constructs to your advantage, and coach you how to decipher others' code if you find it hard to read at a glance. In addition, we'll show you functionality and performance enhancements that can easily be achieved with tacit techniques, expanding your vision of what's possible with APL.

Keywords: function composition, trains, tacit, operators

SA3: Applied Performance Challenge
Sunday 09:30 – 13:00
Karta Kooner and Aaron Hsu

This workshop is designed to encourage a holistic understanding of how to think about and improve the performance of APL code. You will be given the opportunity to collaboratively apply a variety of techniques at all scales of performance optimisation to a non-trivial APL application.

In this hands-on workshop, you will be able to traverse through all the phases of application optimisation to understand how each phase impacts the others. We intend to cover both high level and low level optimisation, as well as high and low level performance analysis.

Keywords: performance, optimisation, profiling, architecture

SP1: Project Management using Link, Cider, and Tatin (Part 2 of 2)
Sunday 14:00 – 17:30
Gilgamesh Athoraya, Kai Jaeger, and Morten Kromberg

Following on from the workshop on APL project management (SA1), we will look at the process of creating a package from a project, publishing it to a Tatin server, and releasing new versions.

Keywords: package management, Tatin, Cider, Link

SP2: Development Masterclass
Sunday 14:00 – 17:30
Adám Brudzewsky and Stefan Kruger (asst. John Daintree)

Dyalog's graphical integrated development environments (the cross-platform RIDE and Microsoft Windows-only IDE) have many useful features that can enhance your ability to develop and debug code, not all of which are immediately obvious. We'll take you on a hands-on tour in which you'll be able to use existing functionality and add your own, making you a more effective APLer.

Keywords: development, debugging, IDE, RIDE

SP3: Providing and Using Web Services
Sunday 14:00 – 17:30
Brian Becker (asst. Rich Park and Josh David)

A web service is a software system designed to enable communication and interoperability between different applications or systems over the internet. It provides a standardised way for different software applications to exchange data and perform various functions. Web services are commonly used for a wide range of purposes, such as integrating different systems, sharing data between applications, automating business processes, and building distributed applications. Web services provide a scalable and platform-independent way of enabling communication and data exchange between disparate software systems. These functionalities can be accessed and

utilised by other software applications, irrespective of the programming languages or platforms they are built on.

In this hands-on workshop, you'll learn how to:

- Consume web services using HttpCommand.
  HttpCommand is a utility used to issue HTTP requests and receive responses. It can interact with practically any web service. We will:
    - cover the most commonly used features of HttpCommand
    - learn how to develop and debug web service requests
    - access variety of web services including web services that require authentication

- Provide web services using the Jarvis web service framework.
  Jarvis makes it easy to make many Dyalog applications available over the internet. We will:
    - develop a simple web service in 5 minutes
    - cover the essential features of Jarvis
    - examine and experiment with a sample web service
    - demonstrate how to access our web service from a browser and using HttpCommand

Keywords: Web services, HttpCommand, Jarvis

TP1: Testing APL Systems
Thursday 13:30 – 17:00
Morten Kromberg, Michael Baas, and Stefan Kruger

Writing your own test framework in APL only takes a few minutes, which is one of the reasons why there are so few shared frameworks – most users prefer to build something that is tuned to their own taste and specific internal requirements.

Whether you are starting a new APL project or it is time to revisit the way you maintain an existing system, it is worth taking a look at best practices in the software engineering community. Many modern practices also make good sense for APL development, and can be easily adopted. This workshop will begin with the introduction of a minimalist testing framework,

present Dyalog's own "DTest" framework, and end with a demonstration of how you can establish an "industry standard" continuous integration pipeline using GitHub.

Keywords: testing, code coverage, Continuous Integration, DTest, GitHub actions

TP2: Leading Axis Theory and Practice
Thursday 13:30 – 17:00
Rich Park and Adám Brudzewsky

This hands-on workshop will show you how to design your functions and structure your data so that you can wield the keys to the array kingdom – the *rank* operator and *dyadic transpose*. Rich and Adám will demonstrate how these, together with various other leading axis primitives, can simplify your code and give you superior performance. You'll be presented with various problems to solve, as well as participate in a discussion on how to maximise benefits from leading axis theory.

Keywords: rank operator, transpose, leading axis theory, performance

TP3: APL Functions to Import, Export, and Process Data in Files
Thursday 13:30 – 17:00
Richard Smith and Peter Mikkelsen

The interpreter provides several built-in functions to import, export, and process data in files, and to manage the host file system. These are invaluable tools in their own right, and can be the building blocks for powerful APL applications that are largely independent of the host system on which they run. This workshop examines these functions in depth, starting with a simple introduction and introducing their Dyalog v19.0 enhancements.

Keywords: import data, export data, built-in portable file functions

Abstracts: Dyalog Presentations

D01: Welcome to Dyalog '23
Gitte Christensen, Managing Director (CEO)

Dyalog Ltd's CEO opens the user meeting.

D02: The Road Ahead
Morten Kromberg, Technical Director (CTO)

In accordance with tradition, Morten looks briefly back over his shoulder before turning his gaze to the future, presenting his view of the road that lies before Dyalog and users of Dyalog APL.

D03: Dyalog Version 20.0 – Part 1
John Daintree

John revisits token-by-token tracing (which will be in Dyalog v20.0, promise!), bringing us up-to-date with what it does and what's been added since last year.

D04: Setting and Getting Variable Values
Adám Brudzewsky

Assignment and using the value of a variable are important elements of programming, but in more complex systems the name of a variable is sometimes dynamic, and determined separately. Current solutions to these situations suffer from poor readability and performance, so Adám proposes an alternative approach.

D05: Revisiting ⎕SH and ⎕CMD
Peter Mikkelsen

Using ⎕SH/⎕CMD to run commands through the operating system's shell is a useful feature, but unfortunately this has some limitations. Peter explores these, and presents a new system function that aims to eliminate them and allow the user to control input output redirections, just like in a real shell.

D06: An Introduction to the Workspace
Richard Smith

Richard reveals a few of the interpreter's secrets as he explains what's inside a workspace and how it is managed. This could give you an advantage when tuning your applications for size, performance, or both.

D07: Future Performance Improvements in Set Functions
Karta Kooner

At Dyalog '22, Karta presented an introduction to work that he was undertaking to improve the performance of set-related primitives. He now presents the results of his work and explores what can be expected in upcoming versions of the interpreter.

D08: Using Packages
Morten Kromberg

Following his presentation on Projects and Packages at Dyalog '22, Morten demonstrates a version of the *Cider* project management system that simultaneously supports two package managers – *Tatin* for packages implemented in Dyalog, and *NuGet* for .NET components.

D09: Dyalog Tools Update
Brian Becker

In addition to Dyalog's language-level tools (for example, system functions), there are also many APL based tools available for general programming, system interaction and interoperation, and application development tasks. Brian explains the efforts being made to make our APL-based tools more readily available, easier to learn, and easier to incorporate into your applications.

D10: Running Dyalog on ARM64 Machines
Ron Murray

With Dyalog v19.0, Dyalog can now run on the Apple Macintosh M1 and M2 machines. Ron presents an overview of the work done to achieve this and explores how the performance of Dyalog on M1 and M2 compares with Dyalog on other architectures before providing an update on Dyalog on the Raspberry Pi 4 as well as in the AWS and Azure cloud environments.

D11: Dyalog + Kafka = True?
Stefan Kruger

Apache Kafka is a distributed event streaming platform that allows you to build real-time data pipelines and streaming apps. It's horizontally scalable, fault-tolerant, and incredibly fast, with latency measured in milliseconds. It's often used as the backbone in microservice architectures in the cloud. Stefan describes his initial experiments on what a Dyalog interface to Apache Kafka might look like.

D12: Dyalog Version 20.0 – Part 2
John Daintree

John has some generic problems<sad,face>. What can he do about them?

D13: Giving Key a Vocabulary
Adám Brudzewsky

The *key* operator (⌸), introduced in Dyalog version 14.0, is arguably the most successful recent addition to the language, enabling data scientists and finance processors to group, summarise, and count values in various ways. However, sometimes key disappoints because it doesn't know the intended order or results, is missing placeholders for absent keys, or includes unwanted data. Adám proposes a simple extension that addresses these issues.

D14: The Return of Uncle Andy's Fireside Chat
Andy Shiers

Back by (allegedly) popular demand, Andy will once again delve into the lesser-known aspects of Dyalog and our backend systems – he's got several versions to talk about!

D15: Co-dfns Update 2023
Aaron Hsu

The Co-dfns project is an initiative to expand the reach and capabilities of APL through compiler design, language research, and the use of APL to tackle problems that have been previously under-represented in the modern APL community. Aaron provides an update on these efforts, including the status and current capabilities of the compiler, a roadmap for the future, and practical details concerning how Co-dfns can be applied today.

D16: Statistical Libraries for Dyalog
Josh David

With Data Analytics and Machine Learning on the rise, it is now critical to have statistical libraries available. Josh takes a look at some of the open-source statistical libraries available to the APL developer.

D17: How I Won the APL Problem Solving Competition – Introduction and Prize Ceremony
Brian Becker

The 15th annual International APL Problem Solving Competition took place earlier this year. Brian summarises this year's contest and introduces the grand prize winner, culminating in the award ceremony.

D18: Vega Charts with Dyalog
Rich Park

Vega-lite is a high level data visualisation grammar – a declarative language for describing visual presentations in JSON (JavaScript Object Notation). Charts are rendered using a JavaScript library and, thanks to the HTMLRenderer, we can provide data directly from APL and produce graphics ready for publication on the web. Rich demonstrates a simple interface for producing graphs from APL data using Vega-lite.

D19: Dyalog Licensing
Jada Andrade

Licensing can be a very complex subject, and it can be difficult to determine what your exact licence requirements are. We've been looking at simplifying our current structure to make the process more intuitive. Jada presents the changes to licensing that will take effect in January 2024.

D20: Dyalog Ltd – Behind The Scenes
Stine Kromberg

Dyalog Ltd is growing and times are changing. Stine presents some of the work going on in the background to help us evolve in the years to come.

Abstracts: User Presentations

U01: APL Worker Bees – Another Way to Run APL Tasks in Parallel
Stig Nielsen, SimCorp (Denmark)

Stig demonstrates a small "WorkerBees" project that enables you to run APL tasks in parallel on separate threads using the concept of "hosted APL" and .NET async/await and tasks. The aim is to create reusable "APL worker bees" that can be dedicated to certain tasks, where "parallel each" is short-lived thread processes.

U02: Transforming and Streamlining a Complex Development Process using Dyalog
Mark Wolfson, BIG (U.S.A.)

BIG is a company in the jewellery industry that integrates with dozens of systems to import data from 1,000 retailers. The data is used to provide inventory analysis and merchandising consulting for the retailers, to provide sell-through data to manufacturers, and to integrate to several industry service companies. The end-user tools, and the integration applet, are written in C#, ASP.NET, JavaScript, MSSQL, and KendoUI.

At Dyalog '22, Mark introduced us to BIG's new Dyalog-based production environment. Dyalog's tools and features, including SQAPL, Jarvis, HttpCommand, .NET integration, ⎕JSON, and ⎕CSV, have enabled BIG to address specific aspects of its processes, and provide the ability to respond to customer needs faster and more flexibly than ever before. Mark updates us on how BIG's use of Dyalog and its tools has grown in the last year.

U03: The Evolution of APLTree and APL-cation
Kai Jaeger, independent (Germany)

At Dyalog '18, Kai presented the evolution of the APLTree and the APL-cation projects. In the five years since then, all APLTree projects have been transformed into Tatin packages. Kai discusses the benefits and implications of this change, and updates us on the latest changes and additions to these open-source projects.

Relevant projects:
- APLTree: a collection of tools to help Dyalog application developers – https://github.com/aplteam/apltree/wiki
- APL-cation: a library of tools ("members") for developing full-scale applications in Dyalog – https://github.com/aplteam/apl-cation/wiki
- Tatin: a package manager for Dyalog – https://tatin.dev

U04: Music: APL vs APS (A Pointy Stick)
Ray Cannon, independent (U.K.)

Ray muses on about a decade of trying to play J.S Bach's "Toccata and Fugue in D minor, BMV565" using APL. His musings include sound "WAV" file format and their creation, what makes up a chord, (adding of 3 sine waves), what harmonics are and how they can be combined to convert a simple tone into the sound of organ pipes, and adding reverberation to a tune to give the effect of a large concert hall. He culminates in his rendition of BNV565 in full stereo, with an animation showing each note as it is played.

U05: Converting a COM Server to a Jarvis-based Web Service
Finn Flug, Dittrich & Partner Consulting GmbH (Germany)

DPC recently migrated an application from APL+WIN to Dyalog. Finn describes the process, particularly the conversion of a COM Server to a Jarvis-based web service and the deployment of the application as a Docker container.

U06: Dyalog, AWS, Jarvis, Docker…What's Not to Like?
Claus Madsen, FinE Analytics (Denmark)

Claus has put a complex financial application in the cloud and made it available to clients anywhere in the world. He explains how he – much to his surprise – ended up enjoying his journey from saved workspaces to the automated building and deployment of docker containers to Amazon Web Services.

U07: Once Upon A File
Elena Paviotti and Gianna Folladore, SimCorp Italiana (Italy)

Elena and Moris present some amusing stories about frustrating experiences with files and people.

U08: quAPL – A Quantum Computing Library in APL
Marcos Frenkel (NCSA/University of Illinois at Urbana-Champaign (U.S.A.)

Quantum computing is a promising technology emerging from harnessing the laws governing the world of atoms. Writing quantum programs equates to specifying circuits, which is cumbersome and does not scale intellectually. We have found at NCSA that APL naturally expresses quantum concepts, leading to higher level programming constructs. Marcos demonstrates these connections and how they might help to revolutionise this form of computing.

U09: APL and Metallurgy
Jesús Galán López, Ghent University (Spain)

The capacity of APL enables domain experts to solve difficult problems makes it the perfect candidate to support scientific and engineering work. In the field of materials science and metallurgy, there are a large number of analysis and modelling problems that could be successfully tackled with the help of APL. Moreover, APL has traditionally been not only a programming language with useful applications, but also a powerful learning tool. Jesús shows us how APL is being used in the field of metallurgy, in an academic environment, both for education and research.

U10: Teaching Linear Algebra with APL
Asher Harvey-Smith, University of Warwick (U.K.)

As part of a Dyalog internship over the summer of 2023, Asher has been developing training courses for teaching linear algebra using APL to university students with the aim of spreading the APL message. Asher describes his Dyalog experience and how he thinks the first training course went.

U11: A YAML Parser in APL – Leveraging a Linear Dataflow Model to Unleash APL's Expressiveness
Brandon Wilson, Effective Altruism (Japan)

YAML is a human-readable data-serialisation language. Brandon has written a YAML parser with an architecture that resembles that of Co-dfns (a high performance compiler for a parallel extension of APL's dfns). He discusses the parser implementation, the particular design decisions made, and how a linear data-flow model enables him to write APL that cuts across all levels of detail simultaneously.

U12: Grain Growth and Array Programming
Jesús Galán López, Ghent University (Spain)

Suppose some students are confronted with a relatively simple programming problem in a computational materials course, like writing a grain growth model. These students are not software developers, but future materials scientists. What tools do they know to help them with this task? Could they benefit from using array programming techniques? What about APL? Jesús answers these questions by analysing a real, practical, case.

U13: How I Won the APL Problem Solving Competition (Non-student Winner)
Alexander Block, Viridium Insurance Group (Germany)

Alexander is the winning professional entrant of the 15th annual APL Problem Solving Competition. He describes what led him to Dyalog APL and the competition, and explores some of the approaches leading to the solutions behind his successful entry.

U14: How I Won the APL Problem Solving Competition (Student Winner)
Andrea Piseri, Università degli Studi di Milano (University of Milan) (Italy)

Andrea is the grand prize winner of the 15th annual APL Problem Solving Competition. Following the award ceremony, he describes his experiences of APL/Dyalog and tells us how he managed to master enough of it to win the competition.

U15: Introspections of an Intermediate APLer – The Good, Bad, and Ugly of Learning APL
Brandon Wilson, Effective Altruism (Japan)

Learning APL can be both exhilarating and excruciating. Most pedagogical materials aim at the early intermediate level or lower; other materials are aimed at experts. Brandon offers the perspective of a firmly middle-intermediate APLer trying to make the most of the glittering promises of "APL as a tool of thought" while the pains and joys are salient.

U16: An Implementation of APL Array Notation
Kamila Szewczyk, Saarland University (Germany)

Array Notation is a convenient method for introducing APL array and namespace literals in APL code. Proposals for its syntax and implementation were first made by Phil Last in 2015, and have been discussed and refined for implementation in Dyalog over the last several years. As part of a Dyalog internship over the summer of 2023, Kamila has implemented support for Array Notation in the interpreter and now presents performance benchmarks for the new syntax.

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- 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).

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