DYALOC 2021

Programme for Dyalog '21

Monday 8 November – Tuesday 9 November 2021

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For Dyalog presentation abstracts see pages 4-7.
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For Dyalog presentation abstracts see pages 4-7.
For user presentation abstracts see pages 8-9.

Abstracts: Dyalog Presentations

D01: Welcome to Dyalog '21
Gitte Christensen, Managing Director (CEO)

Dyalog '21 will be different to previous Dyalog user meetings (except Dyalog '20!), but some traditions will survive...Dyalog Ltd's CEO opens the user meeting.

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

Before presenting his view of the road that lies before Dyalog and users of Dyalog APL, Morten spends a little time talking about the year that has passed, and explains why the release of Dyalog APL that follows after 18.0 will be numbered 18.2.

D03: Scripting in Dyalog v18.2
John Daintree

Dyalog v18.2 supports the use of APL as a scripting language, a feature that John previewed in a talk at Dyalog '20. This year, John shows us what actually made it into the product, and revisits the extended multi-line session input that makes scripted APL much more powerful. He also discusses the difficulties of debugging scripts, and introduces a new I-beam that removes some of that pain until it is possible to attach the RIDE to failing script interpreters.

D04: Support for Statistical Distributions in Dyalog v18.2
Ron Murray

Sampling from non-linear distributions is important for Monte Carlo simulation processes. Ron reviews the distributions for which Dyalog supports direct sampling through `16808I` and demonstrates how to sample distributions using Dyalog's interface to the R programming environment.

D05: `⎕JSON` Table Support
Richard Smith

The `⎕JSON` system function provides efficient conversion between JSON-formatted text and APL arrays (including namespaces). However, APL developers use a variety of data structures to store two-dimensional tables, and these do not fit neatly into the non-APL world. Richard explains the extensions made to the `⎕JSON` system function for Dyalog v18.2 that enable the JSON representation of APL matrices in ways appropriate for non-APL applications and developers using JavaScript and "similar languages" to understand them.

D06: Highlights of Dyalog v18.2
Adám Brudzewsky

Dyalog v18.2 includes several new productivity tools and quality-of-life improvements, intended for both professionals and beginners. Adám presents some of these, and shows how programming in APL can now be more fun than ever.

D07: Link v3.0
Morten Kromberg

Link makes it possible to use text source as the foundation for APL application development, rather than binary workspaces or component files. The first version to see significant use outside Dyalog Ltd. was v2.0, distributed with Dyalog v18.0. Link v3.0 is cleaner, more robust, more capable, and has more comprehensive documentation. If you have not looked at Link yet, this is a good time to start!

D08: Dado (Dyalog APL Development Operations)
Josh David

Dyalog APL allows you to program at the speed of thought. But wait! Now that you're storing code in text files, you need to learn about source-code management systems and how to come up with an effective workflow in them, how to properly version an application, etc. A non-trivial amount of time must now be spent on daily development operations before you even get to write a line of APL code.

Josh introduces *Dado* (previously known as AcreTools), an open-source library from The Carlisle Group that takes care of these problems for you. The key functionalities of this DevOps system for Dyalog include:
- streamlined cover functions for git commands
- "one-click" releases to automatically generate release notes, handle application versioning, and upload assets
- dependency management
- a built-in git workflow

This can all be done with a few simple user command functions, without having to leave the Dyalog session.

D09: Python + APL = Py'n'APL
Rodrigo Girão Serrão

What happens if you combine the raw power of APL – your tool of thought – with the countless modules that have been produced by the Python community? APL is famous for enabling the rapid prototyping of solutions to whatever problem you decide to solve, and Rodrigo believes that employing this in combination with the Python ecosystem is sure to maximise potential. To prove his point, he demonstrates how you can combine APL for your data manipulation with Python for your other needs.

D10: Packaging Dyalog Tools
Brian Becker

As the number of utilities and utility libraries for Dyalog grows, it's becoming more important for the APL developer to understand how to manage and employ these utilities as packages. A package can be thought of as a utility that you incorporate into your application. Packages can comprise one or more files containing the APL code that implement the utility; they can also have non-APL resources such as shared libraries (.dll files), configuration files, image files, and so on.

Tatin is a package manager for Dyalog APL that has been developed by APL Team and is currently being adopted by Dyalog to package a number of its tools. Tatin helps manage several aspects in the use of packages including:

- Versioning, so that the APL developer can know what version of a package is being used. This is valuable information for support and upgrade purposes.
- Dependencies between packages, so that when a package depends on other packages, the APL developer is aware of any specific version requirements for a package.

Brian provides an overview of Tatin for both consumers (APL developers who desire to incorporate packages into their applications) and authors (APL developers who desire to publish packages for the use of consumers). He demonstrates how Tatin will be used within Dyalog to publish forthcoming versions of Dyalog tools and utilities, and how the Dyalog user can utilise Tatin as a consumer of those utilities in their application development.

D11: APL Media Update 2021
Richard Park

The world of new media continues to grow for APL and array languages. Rich presents an overview of recent and upcoming publications and events.

Abstracts: User Presentations

U01: Here's The Plan: Learn APL, and Write a Book About It
Stefan Kruger, IBM (U.K.)

Stefan explains how he discovered APL and decided to write the book he thought was missing, how that book came to be, and what he learnt in the process. How can we make APL appeal to a new generation of programmers?

U02: APL in the Driver's Seat
Alexey Miroshnikov, InfoStroy Ltd (Russia)

Many applications use APL as an engine in the background, employing different user interface technology to make calls to business logic written in APL. Alexey describes how InfoStroy's GAMA (Global Asset Management Assistant) asset management solution uses APL to interface with a variety of technologies so that users are presented with a state-of-the art experience.

U03: Extending the Domain of the Probability Operator in TamStat
Stephen Mansour, The University of Scranton and Misericordia University (U.S.A.)

The probability operator in TamStat ordinarily takes a distribution function as its left operand and a relational function on the right to produce a probability from a statistical distribution. The domain of the probability operator has now been extended to take a logical function as its left operand and a contingency matrix as the right operand. This allows the computation of probabilities using the complement rule (not), the addition rule (or), the multiplication rule (and), and the conditional rule (if) – other logical functions are also included in the domain. Stephen explains how replacing the contingency matrix with the independent operand means that the same probabilities can be calculated assuming that the two events are independent and introduces the Probability Wizard (which generates Venn Diagrams) that has been created to work with this new functionality.

U04a: The 2021 APL Problem Solving Contest – Introduction
Brian Becker

The 13th annual APL Problem Solving Competition took place earlier this year. Brian introduces the contest and second place winner.

U04b: The 2021 APL Problem Solving Competition – Runner-Up's Presentation
Victor Ogunlokun, Obafemi Awolowo University (Nigeria)

Victor describes his experiences of APL/Dyalog and tells us how he managed to master enough of it to win second place in this year's APL Problem Solving Competition.

U05: The Array Cast (live podcast recording)
Host: Conor Hoekstra, NVIDIA (Canada)

Conor Hoekstra is the host of [The Array Cast](#), a panel-based podcast on array languages. Since launching a few months ago, Conor and his panellists have produced a series of extremely interesting podcasts, with special guests from many walks of Array Life. As the final session of Dyalog '21, The Array Cast will be broadcast live for the first time.

The Presenters

Gitte Christensen, [Dyalog Ltd.](#) 🇩🇰

Gitte is CEO of Dyalog Ltd. She has worked as an APL programmer and consultant, headed development and sales of commercial software based on APL since 1983. In 2005 she ended up where she started, at an APL language vendor – but this time as the CEO.

Morten Kromberg, [Dyalog Ltd.](#) 🇩🇰

Morten is CTO of Dyalog Ltd. He has over four decades of APL experience, implementing databases, crew scheduling systems and production models. He joined Dyalog after spending about 15 years building up ideas for technical direction as a user of Dyalog.

Adám Brudzewsky, [Dyalog Ltd.](#) 🇬🇧

Adám is a developer at Dyalog Ltd. He is involved with APL projects like Link and SALT, and also participates in language design and social media (including the popular [APL Orchard chat room](#) and the [APLcart code phrase collection](#)). He regularly teaches APL to both beginners and more advanced users, through workshops, presentations, webinars, webcasts, blog posts, APL Wiki articles, and answers to questions on Stack Exchange.

Brian Becker, Dyalog Ltd. 🇺🇸

Brian is Tools Architect at Dyalog Ltd. With over 45 years of APL experience, Brian has developed APL applications across a variety of industries; he now designs and implements complex APL tools like MiServer and Jarvis. Brian has been involved with the APL Problem Solving Competition since its inception in 2009, initially as a judge and then also as primary content developer.

John Daintree, Dyalog Ltd. 🇬🇧

John is Chief Architect at Dyalog Ltd. He recently celebrated 30 years of working at Dyalog Ltd, and develops everything object-oriented, the Microsoft Windows IDE, and bridges to things like .NET, CEF, the RIDE, and the file system.

Josh David, Dyalog Ltd. 🇺🇸

Josh is a developer at Dyalog Ltd. His initial exposure to APL was through an internship, during which he entered (and won!) the 2016 APL Problem Solving Competition. He now primarily serves as an APL consultant to North American clients, but also works on APL tools.

Rich Park, [Dyalog Ltd.](#) 🇬🇧

Rich is a developer at Dyalog Ltd. He has taught APL at multiple schools, created an online self-study course, is a regular host of [Dyalog webinars](#), and has demonstrated APL on Twitch and YouTube.

Richard Smith, [Dyalog Ltd.](#) 🇬🇧

Richard is Development Manager at Dyalog Ltd. Prior to joining Dyalog Ltd he gained extensive experience of compiler development and language design; he now works on the interpreter, developing various cross-platform utility and system-related tools.

Rodrigo Girão Serrão, [Dyalog Ltd.](#) 🇵🇹

Rodrigo is a developer and content creator at Dyalog Ltd. He mainly works on updating [*Mastering Dyalog APL*](#) (the principal Dyalog APL tutorial book), but also produces instructional videos. Rodrigo has hosted numerous workshops teaching mathematics and programming (these are also the subjects of his [Mathspp blog](#)).

Ron Murray, Dyalog Ltd. 🇺🇸

Ron is a developer at Dyalog Ltd. He has worked with APL intermittently for around 50 years, taking breaks to work at Microsoft, Amazon and an internet television company, and he now works on interpreter QAs and developing advanced tools.

Alexey Miroshnikov, InfoStroy Ltd. 🇷🇺

Alexey has been working with APL since 1979, starting with APL 2.0 for the CDC Cyber 172 super computer at the Academy of Sciences of the USSR (not the same as IBM's APL2). His work at the Academy included a number of research projects related to econometrics, as well as developing hybrid software applications that embedded APL with other development systems (like FORTRAN for fast computations). In 1990 he founded InfoStroy, and has run it ever since. InfoStroy's GAMA – a hybrid and sophisticated application with APL at its root – is the market leading asset management software solution in Russia.

Conor Hoekstra, NVIDIA 🇨🇦

Conor (he/him) is a Senior Library Software Engineer at NVIDIA working on the RAPIDS team. He is extremely passionate about programming languages, algorithms and beautiful code. He is the founder and organiser of the Programming Languages Virtual Meetup, has a YouTube channel and is the host of two podcasts: Algorithms + Data Structures = Programs and ArrayCast. Conor is also the program chair for the CppNorth conference and is an avid conference speaker. You can find all of Conor's conference talks and podcast appearances here.
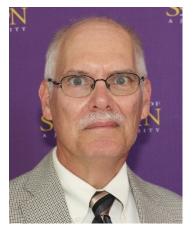
Stefan Kruger, IBM 🇬🇧

Stefan likes learning lesser-known programming languages, and discovered APL in about 2017. He's an occasional contributor to Dyalog's blog, and an enthusiastic promoter for APL on the Mac. He holds a PhD in Computer Science, and works for IBM making databases.

Stephen Mansour, The University of Scranton and Misericordia University 🇺🇸

Stephen has been using APL since 1985, when he worked on the ALORS2 project written in APL2 at IBM. He developed a billing system in Dyalog APL while working at Security APL in Jersey City, and wrote a portfolio optimisation system and a mortgage structuring system in Dyalog APL while working at the Carlisle Group in Scranton, PA. He is currently working on TamStat, a program written in Dyalog APL for use in teaching statistics.

Victor Ogunlokun, Obafemi Awolowo University 🇳🇬

Victor is studying for a BSc in chemical engineering at Obafemi Awolowo University. He entered the 2021 APL Problem Solving Competition with no prior knowledge of APL but became skilled enough to be the second place prize winner.

Miscellaneous

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