

# Group 1: Features of Dataset Applications

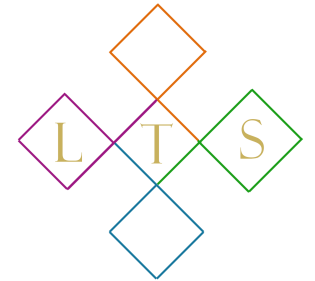
## User Interface Features Typical of Dataset Applications

The code for each dsC data set includes a customized “Dataset Application” which displays individual samples and groups of samples via 2D, 3D, and native-compiled GUI controls. Each Dataset Application can thereby make use of advanced visual and interactive features that are uniquely possible when using customized, native-compiled GUI classes. The following screenshots will show several examples of these features, including:

**Specialized Top-Level Controls** Tree Widgets, Stacked Widgets, and Graphics Scenes.

**Context Menus** Systematically organize functionality around UI layouts.

**Multi-Window Displays** Divide application functionality in multiple specialized top-level windows and/or dialog boxes.



Linguistic Technology Systems



# Initial Application Window

Customize Build

Activate TCP

Screenshot

Main Flow Temperature Oxygen

Index	Flow	Time With / Average	Time Against / Delta	Temperature C° / K°	Oxygen (calculated)
▶ 1	0.561	0.000219893	0.000220329	49.60	
▲ 2	1.17	0.000219764	0.000220614	49.70	
		0.000220189	8.49999e-7	322.15	93
	% 0.106536			67.3623	1
	# 159			322	394
▶ 3	5.133	0.000218866	0.000221751	49.70	
▶ 4		0.000218223	0.000223191	48.90	
▶ 5		0.000218854		49.50	
▶ 6		0.000219006		49.60	

In addition, nested rows can display supplemental information, such as data values' rank (3) and percentage (2) (on the scale of the least to greatest value) relative to all other values for each statistical parameter.

Using a "tree widget" (a two-layer spreadsheet), instead of a conventional spreadsheet, allows the Dataset Application to distinguish primary values (those measured directly by physical devices and experimental equipment) from intermediate values calculated via algorithms.

Sample

Up/Down

Peer Up/Down

First

Peer First

DOUBLE

Graphics

☐ 2D 25x25 ☐ 2D 12x12 ☐ 2D 3x3 ☐ 2D 37x75  
☐ 3D 25x25 ☐ 3D 12x12 ☐ 3D 3x3 ☐ 3D 37x75

# Interacting with the Main Window

Customize Build

Activate TCP

Screenshot

Main

Flow

Temperature

Oxygen

Index	Flow	Time With / Average	Time Against / Delta	Temperature C° / K°	Oxygen (calculated)
33	0.589	0.00022861 0.000228828	0.000229046 4.35997e-7	5.40 278.15 7.25373	80 0 34
%	0.0531...				
#	111			1	
34	1.098	0.000228924	0.000229746	5.40	
39	4.988	0.000228814	0.000231814	5.40	
35	5.044	0.000227894	0.000230985	5.40	
37	0.554	0.000229983	0.00023039	5.50	
38	1.057	0.000229819	0.000230657	5.50	
31	5.057	0.000229433	0.000232403	5.50	
30	1.108	0.000230476	0.000231223	5.70	
29	0.484	0.000230511	0.000230934	5.80	

About/ Show in Document (may require XPDF)

Copy Column to Clipboard (values)

Copy Column to Clipboard (ranks)

Sample Up/Down

Peer Up/Down

First

Peer First

Graphics

2D 25x25

2D 12x12

2D 3x3

2D 37x75

3D 37x75

Minimize

OK

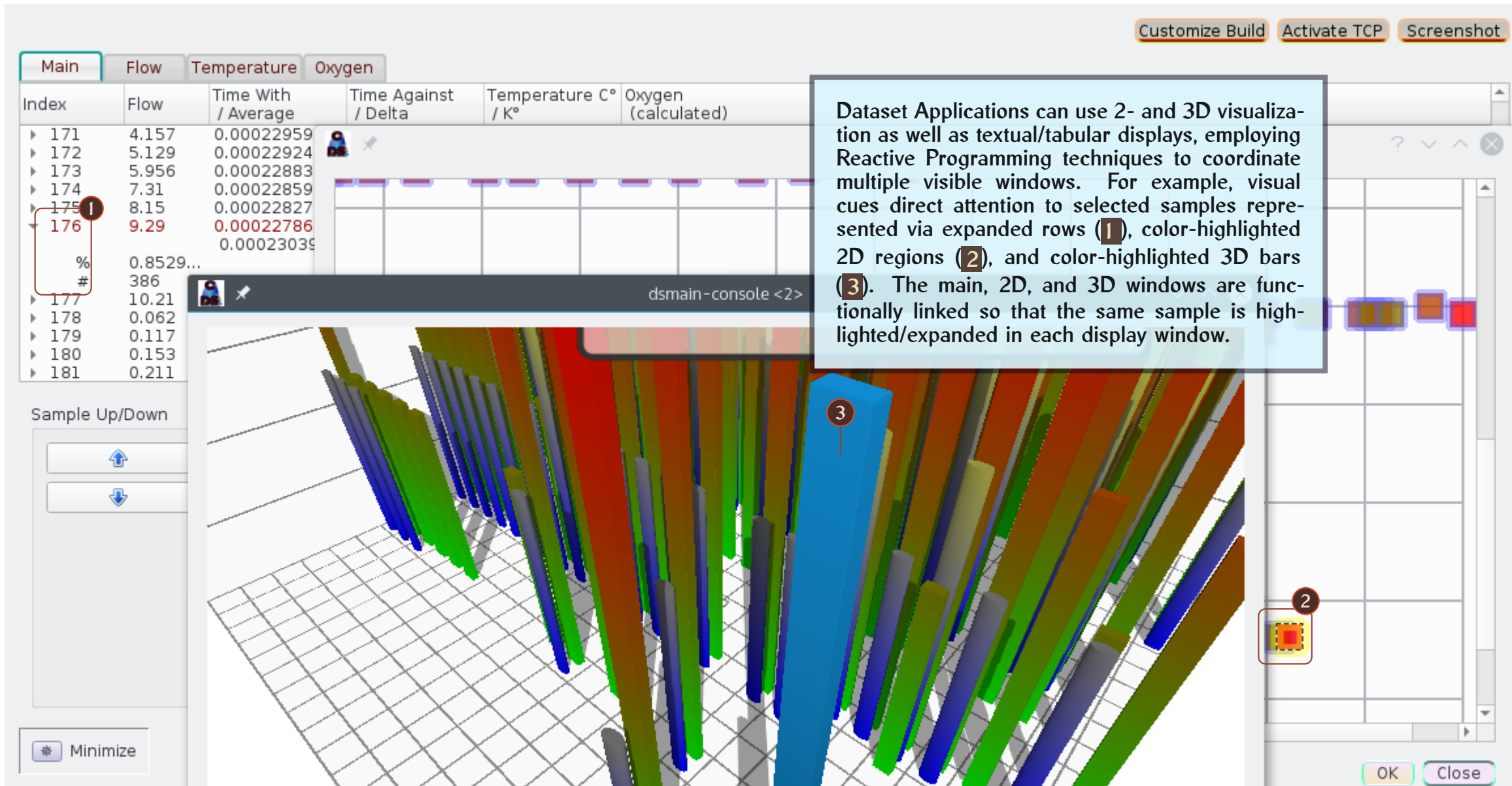
Proceed

Close

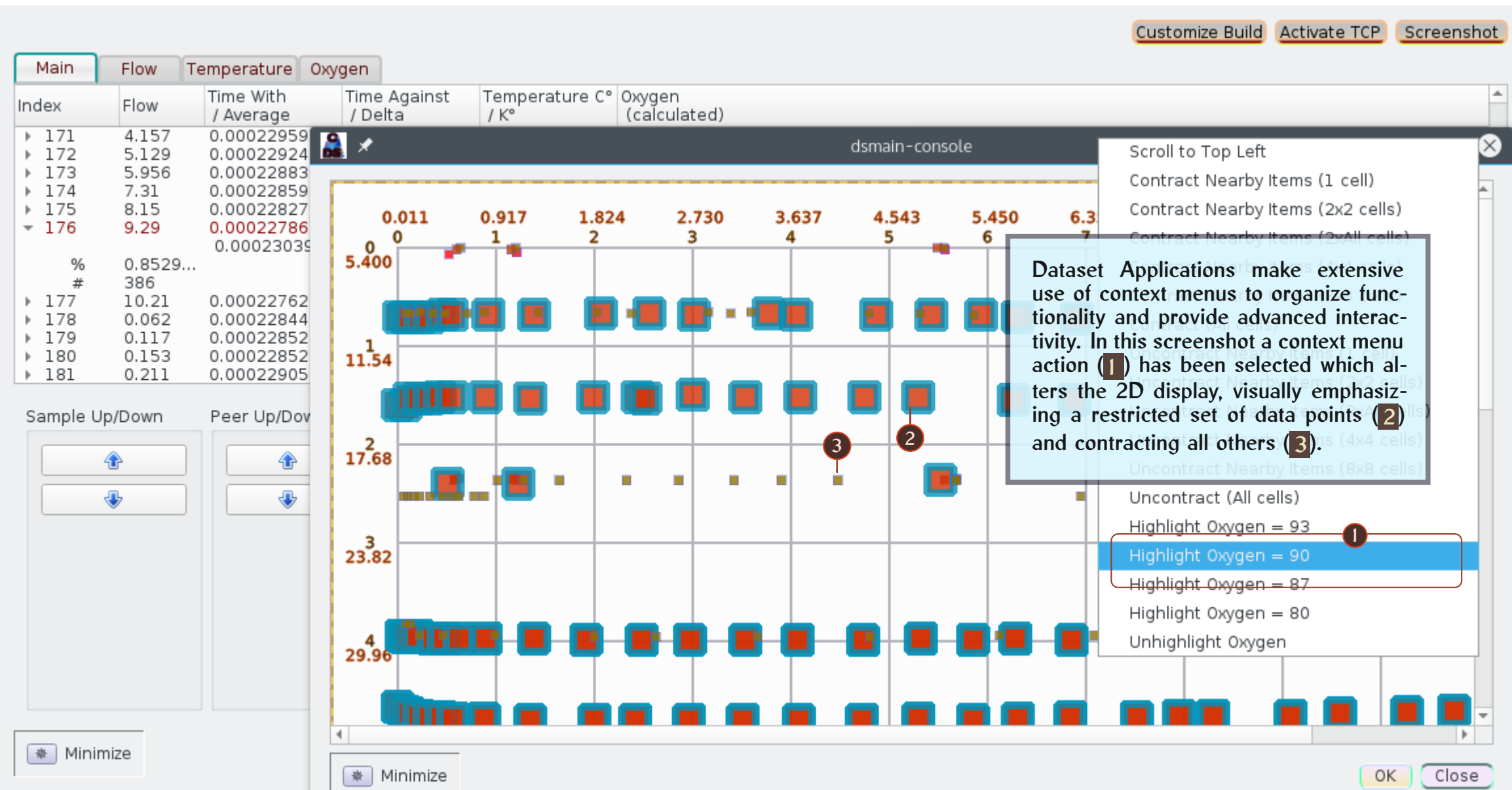
Despite being implemented as a tree widget instead of a two-dimensional spreadsheet, the primary window for this Dataset Application has many spreadsheet-like features, such as copying columns of data (1) and sorting columns by switching notebook tabs (2); each notebook page shows the data sorted on a specific parameter.

Two different sets of navigation buttons enable the user to scroll through samples according to the currently selected sort parameter (3), or according to the primary index (4).

# Coordinated Data Visualization



# Interacting with the Visuals



# Getting Information About Modeling Parameters

## Using Dataset Applications as Pedagogical Tools

In addition to interactive visualization, Dataset Applications are useful tools for understanding experimental protocols and research methods. Within Dataset Applications, modeling units such as statistical parameters and record fields are visible in situ within a GUI — identified by labels, buttons, and other interactive micro-controls. As a result, users encounter modeling elements in a structured visual-interactive context. To learn more about modeling elements, Dataset Applications are equipped with several pedagogical features shown on the following screenshots:

**“About” Dialogs** Brief summaries of research trms and parameters.

**XPDF Links** Links back to research articles read in an embedded PDF viewer.

**XPDF Enhancements** The XPDF viewer can be customized for each data set and included with dataset code, with extra features to integrate article or book texts with Dataset Applications.

# Obtaining Information About Parameters

Customize Build

Activate TCP

Screensho

Main Flow Temperature Oxygen

Index	Flow	Time With / Average	Time / Det
▶ 33	0.589	0.00022861	0.00
▼ 34	1.098	0.000228924	0.00
		0.000229335	8.22
%	0.0999...		
#	154		
▶ 39	4.988		
▶ 35	5.044		
▶ 37	0.554		
▶ 38	1.057		
▶ 31	5.057		
▶ 30	1.108		
▶ 29	0.484		

Context menus also allow users to obtain information and explanations about individual parts of the data set, such as individual statistical parameters. In this screenshot, the user has right-clicked on a data column (Flow) and has chosen a context menu action which shows, via a dialog box, a precis of the quantities represented in that column and their significance for the data set as a whole.



Flow of Oxygenated Air



Click 'Show Details' for a summary or 'More' for PDF/Original Article links.

More (PDF) ...

Cancel

Hide Details...

The Flow measurements calculate the flow of oxygenated air (as needed for Continuous Positive Airway Pressure (CPAP) devices) given inputs of ambient temperature and sound time travel. The third (nested) row beneath the Flow value shows each sample's Flow 'rank' (where lower ranks mean that a sample has less Flow; the rank #1 is the sample with least flow). The second nested value shows each sample's flow measurement as a fraction of the maximum measurement

Sample Up/Down



x3 ☐ 2D 37x75

x3 ☐ 3D 37x75

Minimize

OK

Proceed

Close

# Embedding XPDF

Customize Build

Activate TCP

Screenshots

The screenshot displays a software interface for viewing PDF documents. At the top, there are three buttons: "Customize Build", "Activate TCP", and "Screenshots". Below these, a browser-like address bar shows the path: `/home/nlevisrael/sci...sign/MSR/ar/cpp/about/about-files/main.pdf`. The main content area shows a PDF page titled "2 of 21" with the "WILEY Expert Systems" logo. The text on the page discusses the speed of sound in air, mentioning factors like temperature, humidity, and altitude. A red line connects a callout box to a specific part of the text. The callout box contains the following text:

Each data set can be linked back to an original article or other publication reporting on the data set and experimental results. Different parts of the data set can be linked to textual anchors in the publication.

In this example, after viewing a short description of a particular data field inside the Dataset Application, researchers have the option of studying that parameter further by reading at the location in the original publication where the field is introduced or described. The XPDF viewer is compiled as an embedded application within the main Dataset Application and can itself be customized for each data set.



# Testing and Fine-Tuning Dataset Applications

## Tools for Editors and Developers

Although ordinary users can explore and visualize dsC data sets “Out of the Box”, advanced users have many options for customizing their build of the application in terms of their specific roles and available 3rd-party libraries. These fine-tuning possibilities include:

**Test Suites** Tools for creating and/or running test suites to ensure that the Dataset Application works across platforms.

**Data Export** Tools for reusing data in other projects.

**External Libraries** Some features like XPDF and 3D graphics require libraries that cannot be published with the data set in source code form. Advanced users can select which of these libraries to incorporate into their version of the Dataset Application.

**Scripting** Data sets can compile their own scripting environment to automate testing and manipulation of research data.

**Networking** Dataset Applications can use an embedded TCP server to communicate with other applications, enabling multi-application workflows (this is also how testing is implemented).

# Configuring the Data Set Application

The screenshot shows the 'Dataset Creator' configuration window. It has a sidebar on the left with icons for 'In', 'Oxygen (calculated)', and 'S'. The main area is divided into sections: 'Operating System Profile', 'Compile Options', and 'Select User Role'. The 'Operating System Profile' section has a dropdown menu set to 'Linux (Generic)' and checkboxes for '32 Bit' (unchecked) and '64 Bit' (checked). The 'Compile Options' section contains several checkboxes: 'Use 3d graphics' (unchecked), 'Use Kauvir/Phaon and TCP (for tests)' (unchecked), 'Use XPDF' (checked), 'Qt PNG/FreeType libraries' (unchecked), 'System PNG/FreeType libraries' (checked), 'Build KDMI Components and Console (for data export)' (unchecked), 'Build Research Object Information Console' (checked), 'Build External XPDF Application' (checked), and 'Preview (right click "Administrator" to enable/disable)' (unchecked). There is a 'Reset' button and a text label '(reset files to original state; right-click "Administrator" to enable/disable)'. The 'Select User Role' section has checkboxes for 'User, Reader, Researcher (Default)' (unchecked), 'Editor' (unchecked), 'Tester' (unchecked), 'Administrator' (unchecked), and 'Author' (checked). At the bottom, there are buttons for 'Minimize', 'OK', 'Proceed', and 'Cancel'. A red box labeled '2' highlights the 'Select User Role' section. A red box labeled '1' highlights the 'Customize Build' button. A red box labeled '2' highlights the 'Proceed' button. A red box labeled '1' highlights the 'Activate TCP' button. A red box labeled '2' highlights the 'Screenshot' button. A red box labeled '2' highlights the 'Click To Set Compiler Options Based On User Role' button.

Operating System Profile

Linux (Generic) 32 Bit 64 Bit

Compile Options

☐ Use 3d graphics ☐ Use Kauvir/Phaon and TCP (for tests)

☒ Use XPDF ☐ Qt PNG/FreeType libraries

☒ System PNG/FreeType libraries

☐ Build KDMI Components and Console (for data export)

☒ Build Research Object Information Console

☒ Build External XPDF Application

☐ Preview (right click "Administrator" to enable/disable)

Reset (reset files to original state; right-click "Administrator" to enable/disable)

Select User Role

☐ User, Reader, Researcher (Default) ☒ Author

☐ Editor ☐ Tester ☐ Administrator

Click To Set Compiler Options Based On User Role

Customize Build Activate TCP Screenshot

Minimize OK Proceed Cancel

Using Qt Creator, the Dataset Creator will automatically launch the main Dataset Application with every feature needed in order to visualize and explore the data. In addition, the data set includes several configurations allowing users to incorporate more specialized or complex features, such as XPDF, test suites, and data export code. Users can fine-tune which additional features they wish to utilize — via a separate dialog box (1 and 2) — to create a customized build of the main Dataset Application and supplemental executables.

The Dataset Creator also recognizes distinct "roles" (2), including general readers, authors, those who double-check the main Dataset Application via a test suite, and those who design the test suite and write dataset code overall (dubbed "Administrators").

# Testing the Data Set Application

Dataset Creator includes a sophisticated framework for building and running test suites to ensure that raw data is processed correctly and that User Interface components work properly on different Operating System platforms. This includes a separate testing application that sends instructions to the main Dataset Application via TCP (1).

The testing application has several features to facilitate running tests, including options to repeat tests, mark success or failure (2), and examine the system clipboard (3).

Copy Temperature Ranks: This test should result in the Temperature ranks (sorted by index) being copied to the system clipboard, which can be verified by pasting the clipboard into a blank file and comparing the lines (there should be one sample per line) to the Temperature column as viewed in the tree table dialog.

Testers can also read a description of each test (4), and view the scripts used to create them.

Customize Build Activate TCP Screenshot

Test Returned

Test Copy Temperature Ranks: Pass or Fail?

Pass

Fail

Hide Details...

Note: For tests which involve values copied to the system clipboard, you can use the text area below as a scratch pad to examine the clipboard contents.

318  
322  
323  
284  
317

Minimize

OK

OK

Proceed

Close

# Features of Dataset Applications for Books

## Datasets Compiled From Book Examples

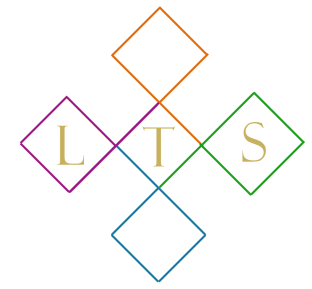
The remaining screenshots demonstrate how data sets can be used even outside of a lab context generating experiment data. The pictured data set represents a corpus of linguistic examples mined from Wiley's *Blackwell Handbook of Pragmatics*. Creating data sets from book-length publications can encompass several steps:

**Text Mining** In the case of linguistics, this involves locating example sentences within linguistics texts and storing them as an independent corpus.

**Canonical Formatting** If possible, linguistics texts should be annotated so that extracting examples can be automated.

**Annotation** Linguistic corpora are often annotated to identify structural details, beyond raw text, in each sample.

# Creating a Data Set from a Book



This screenshot shows a linguistics dataset that illustrates several advanced interactive features made possible by the Dataset Creator's Qt-based front-end technology. Useful features include context menus embedded with drop-down selections (1) and button/checkbox groups for filtered scrolling through a list of samples (2 and 3).

The screenshot displays the Dataset Creator interface with several key features highlighted by numbered red circles:

- 1**: A context menu is open over a sample in the list, showing options like "Activate TCP" and "Customize".
- 2**: A group of filter checkboxes is highlighted, including "Text", "Dialog", "Intonation", "Paragraph", "Ambiguity", "Context", "Logic", "Scope", "Polarity", "Belief", "Convention", and "Idioms".
- 3**: A group of navigation buttons is highlighted, including "Filtered Up/Down", "Examples Up/Down", "Peer Up/Down", "Chapter Start/End", and "Chapter Up/Down".

The interface also includes a "Filter Forms" section, a "Text" input field with the sample "I have received the e-mail. ?Nevertheless it's in Dutch.", a list of samples with columns for "Text", "Form", and "Dialog", and a "First" button with a "Auto Expand" toggle set to "ON".

Text	Form	Dialog
She'll be better off in a new place.		
I have received the e-mail, but it's in Dutch.		
I have received the e-mail. ?Nevertheless it's in Dutch.	Text 22 (N_A) 257	
I have received the e-mail. ?Nevertheless it's in Dutch.	Text 22 (N_A) 257	
Her husband is in hospital. Yet she's seeing other men.	Text 23 (N_A) 257	
Her husband is in hospital. Yet she's seeing other men.	Text 23 (N_A) 257	
Her husband is in hospital and she's seeing other men.	Text 24 (N_A) 257	
Her husband is in hospital. But she's seeing other men.	Text 25 (N_A) 257	
Her husband is in hospital. Nevertheless she's seeing other men.	Text 26 (N_A) 257	
Oscar knocked the vase and it broke.	Text 27 (N_A) 260	
Did Oscar break the vase?	Text 28 (N_A) 260	

# Interacting with Data Samples

Filter Forms

☒ Text  
☒ Intro

Filter Issues

☒ Logic  
☒ Convention  
☒ Scope  
☒ Idioms

Activate TCP

Screenshot

Customize Build

The linguistic samples comprising this data set are all example sentences, phrases, or dialog-snippets that are used, in the *Blackwell Handbook of Pragmatics*, as expository samples for case-studies of various linguistic phenomenon and pragmatics, semantics, and grammatical theories.

ail. ?Nevertheless it's in Dutch.

Show Original  
OFF

Text	Form	#	Issue	Page	Chapte
▶ She was never really happy here. So she's leaving.	Text	19	(N_A)	256	10
▶ She'll be better off in a new place.	Dialog	20	(N_A)	256	10
▶ I have received the e-mail.	Text	21	(N_A)	257	10
▼ I have received the e-mail.	Text	22	(N_A)	257	10
▶ I have received the e-mail.		22		257	10
▶ Her husband is in hospital.	Text	23	(N_A)	257	10
▶ Her husband is in hospital.	Text	24	(N_A)	257	10
▶ Her husband is in hospital.	Text	25	(N_A)	257	10
▶ Her husband is in hospital.	Text	26	(N_A)	257	10
▶ Oscar knocked the vase ar	Text	27	(N_A)	260	10
▶ Did Oscar break the vase?	Dialog	28	(N_A)	260	10

Filtered Up/Down

Examples Up/Down

Peer Up/Down

Chapter Start/End

Chapter Up/Down

First

Auto Expand  
ON

Minimize

OK

Proceed

Close



# Linking Back to the Book

Filter Forms

☒ Text  
☒ Intonation

☒ Dialog  
☒ Paragraph

Filter Issues

☒ Ambiguity  
☒ Polarity

☒ Context  
☒ Belief

In France, Watergate wouldn't

Text

- ▶ On the table.
- ▶ Every bottle is empty.
- ▶ She seized the knife and stabbed her husband.
- ▶ The Boston Marathon will take place next week. Max thought...
- ▶ My friends were under the impression that I was running a...
- ▶ Sue believes Luke has a child and that Luke's child will visit...
- ▶ In France, Watergate wouldn't have done Nixon any harm.
- ▶ In France, Watergate wouldn't have done Nixon any harm...
- ▶ In France, Watergate wouldn't have done Nixon any harm...
- ▶ The crook paid them with fake money.
- ▶ The crook thought he was paying them with fake money, but...
- ▶ We do not know much about this part of the brain, which...

Filtered Up/Down

Examples Up/Down

Peer Up/Down

Minimize

XpdfReader: /home/nlevisrael/scign/HP/ar/cpp/about/about-files/main.pdf

File Edit View Window Help

690 / 867 113% find

[/home/nlevisrael/scign/HP/ar/cpp/ab](#)

After browsing through the data set, users can link back to the original text to see the current author's discussion of particular examples.

Outline

- 15. The Pragmatics o...
- 16. Pragmatics of La...
- 17. Constraints on Ell...
- ▼ III Pragmatics and its Int...
- 18. Some Interaction...
- 19. Pragmatics and A...
- 20. Pragmatics and S...
- 21. Pragmatics and t...
- 22. Pragmatics and t...
- 23. Pragmatics and l...
- 24. Historical Pragma...
- 25. Pragmatics and L...
- 26. Pragmatics and C...
- ▼ IV Pragmatics and Cogni...
- 27. Relevance Theory
- 28. Relevance Theory...
- 29. Pragmatics and C...
- 30. Pragmatic Aspect...
- 31. The Pragmatics o...
- 32. Abduction in Nat...

Bibliography

Index

from the matched spaces to create a **blended mental space** with emergent structure. This creates a conceptual integration network of the form shown in figure 29.4. The generic space represents the structure shared by the inputs. The square in the blended space stands here for the emergent structure which arises in the blending.

So, for example, one way to understand the counterfactual in (6):

(6) In France, Watergate wouldn't have done Nixon any harm.

is to build a conceptual integration network that partially matches two input spaces with prominent aspects of the American political system and the French political system, respectively, and develops an emergent blended space

Figure 29.4 Diagram showing conceptual blending

# A Linguistics Annotation System

## Tools to Facilitate Annotating Linguistic Corpora

The final three screenshots show an example of how a custom-signnd application can facilotat the task of building an annotated corpus from a linguistics text. The components demonstrated here enable several strategies (which can be combined) for dscribing parsing structures and the logical composition of language samples:

**S-Expressions** Representing linguistic units as semantic and syntactic transformations triggered by words assigned to “functional” types.

**Deepndency Grammar** Representing phrase structures viabinter-word syntactic relationships.

**Link Grammar** Representing linguistic structure via connectors internal to each word-sense. Inter-word links are activatd when each word in the pair has a connector compatible with the other word's connector. Intuitively, a connctor represents how one word's meaning or grammatic contribution can be “completed” by linking to a separate word.



# Building Parsing Models

The screenshot displays the **dsmain-console <2>** application window. On the left, a sidebar contains filter options: **Dialog**, **Paragraph**, **Ambigu**, and **Polarit**. The main text area shows a sentence: "She has invited at least Sarah and James." The words "at least Sarah and James" are highlighted in blue. Below the text, there are buttons for "Add (Pair/Tuple)", "Reset", "Clear", "<- (", "(", "(->", ")", ")->", "Copy", "Read", "Splice", and "Back Splice". A red box labeled "1" highlights the "SXP Mode" button and the text "( has invited )".

On the right, a panel titled "Link Grammar (Completion Layer)" is shown, labeled with a red box and "2". It contains a grid of two-letter codes (e.g., AA, AB, AC, etc.) used for selecting relations.

A light blue text box in the center provides context: "The main Dataset Application for the demo Linguistics data set includes a distinct window for building annotations on language examples. Features of this component include an entry area for building S-Expression models of sentences with visual cues such as parenthesis-matching color highlights (1) and sidebars where users can add inter-word annotations using relations drawn from Link Grammar and CoNLL-U Dependency Grammar (2)."

At the bottom right, there are buttons for "OK", "Proceed", and "Cancel".

# Using Dock Widgets For Flexible Layout

Filter Forms

- ☒ Text
- ☒ Intonation

Text

- ▶ We do not k
- ▶ Fred won't c
- ▶ Him be a do
- ▶ It's not goo
- ▶ Did Louise c
- ▶ She doesn't
- ▶ She didn't g
- ▶ You couldn't
- ▶ She has inv
- ▶ She has
- ▶ At least

Filtered Up/Do



Minimize

Minimize

The list of link/dependency relations is also isolated as a "dock widget" that may be dragged to float above the other application windows (1), or "docked" at different positions (left or right) on its parent window. This screenshot also shows a dialog box used for a precis of the individual CoNLL-U (Conference on Natural Language Learning - Universal) and Link Grammar relations (2).

dsmain-console <2>

Dependency Grammar (Refinement

acl	advcl	advmod
appos	aux	case
ccomp	clf	compound
cop	csubj	dep
discourse	dislocated	expl
flat	goeswith	iobj
mark	nmod	nsbj
obj	obl	orphan
punct	reparandum	root
xcomp		

Dependency: nsbj

nsbj: nominal subject

Ok

Hide Details...

A nominal subject (nsbj) is a nominal which is the syntactic subject and the proto-agent of a clause. That is, it is in the position that passes typical grammatical test for subiecthood, and



Minimize

OK

Proceed

Cancel

ivate TCP

Customize

Sho

Issue Page

(N_A)	698
(N_A)	699
(N_A)	700
(N_A)	700
(N_A)	702
(N_A)	703
(N_A)	703
(N_A)	704
(N_A)	704
(N_A)	704
(N_A)	704

Proceed

# Link and Dependency Grammar Annotations

Filter Forms

☒ Text ☒

☒ Intonation ☒

Text

- ▶ We do not know
- ▶ Fred won't order
- ▶ Him be a doctor
- ▶ It's not good, but
- ▶ Did Louise order
- ▶ She doesn't have
- ▶ She didn't get
- ▶ You couldn't get
- ▶ **She has invited**
- ▶ She has invited
- ▶ At least five

Filtered Up/Down

Minimize

dsmain-console <2>

She has invited at least Sarah and James

Add at least Reset

Clear <- ( ( -> ) ) -> Copy Read Splice Back Splice

SXPR Mode

	Pivot	lg:Source Expectation	lg:Target Expectation	lg:Description	dg:Source Expectation
0 {0}	has invited				
1 {1}	invited She				
2 {2}	Sarah James				
3 {3}	at least				

Users can select word-pairs from samples being annotated and then identify the relationship between the selected words, as understood according to Link or Dependency Grammars. The list of link/dependency relations provides an interface to research and read overviews about the relationships.

Dependency Grammar (Refinement Layer)

acl	advcl	advmod	amod
appos	aux	case	cc
ccomp	clf	compound	conj
cop	csubj	dep	det
discourse	dislocated	expl	fixed
flat	goeswith	iobj	list
mark	nmod	nsubj	nummod
obj		than	parataxis
punct		t	vocative
xcomp			

Show Info

Unmark

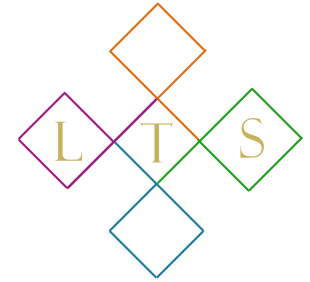
Auto Insert

OK Proceed Cancel

# A3R Document Viewers

A3R applications may embed viewers for document formats such as e-Pub, HTML, and PDF; then supplement conventional publications with special components customized for individual manuscripts: e.g. (as in this case), a widget allowing readers to visually explore patterns in classical Indian music.

The screenshot displays the A3R Document Viewer interface. On the left, a sidebar contains icons for 'Preferences', 'Library', and 'Reading', along with tabs for 'HTML Source', 'Lisp', 'CSS', and 'XML'. The main content area shows the title 'ANTHROPOLOGY AND HUMANISM' and the article title 'Ethnographer as Apprentice: Embodying Musical Knowledge in South India' by 'da Weidman'. Below the title, it indicates 'Published: 26 December 2012' and provides a link for 'Full publication history'. A modal window titled 'Display Tala Types: Jhoomra/Dhamar (14 beats)' is open, showing a visual representation of a musical pattern with red and green boxes. The 'Patterns' section includes a slider for 'Pattern 1 (3-4-3-4)' and 'Pattern 2'. The 'File' field shows the path '/extension/ScignSeer/articles/svg/tala.svg'. At the bottom right, the journal information 'Volume 37, Issue 2', 'December 2012', and 'Pages 214-235' is displayed, along with a thumbnail of the journal cover.



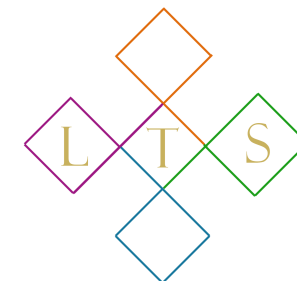
Linguistic Technology Systems



# A3R Document Viewers as Embedded Components

Document Viewers may also be embedded in host applications which provide domain-specific visualization capabilities. For example, chemistry papers might be viewed within IQmol (a Qt-based program for molecular visualization and physical/chemical analysis) via an A3R document-viewer plugin.

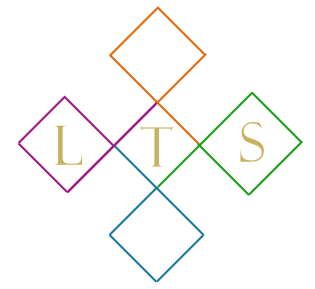
The screenshot displays the IQmol software interface. The top menu bar includes 'Display', 'Build', 'Calculation', 'SONIC', and 'Help'. Below the menu is a toolbar with various icons for file operations and molecular manipulation. The main window shows a 3D ball-and-stick model of a molecule with a blue nitrogen atom, a yellow sulfur atom, and several grey carbon atoms. A context menu is open over the molecule, listing options: 'Configure', 'Select All', 'Reperceive Bonds', 'Duplicate Geometry', 'Atomic Charges', 'Remove', and 'SONIC'. The 'SONIC' option is highlighted, and a sub-menu is visible with the following items: 'Springer Keyword Search: Cysteine', 'Springer Web Search Home', and 'Search Saved Articles'. The 'Springer Keyword Search: Cysteine' option is selected, opening a search results window. This window shows the Springer logo, the search query 'Cysteine', and the results 'Showing 157 results.' The first result is a book titled 'Cysteine Proteases of Pathogenic Organisms' by Robinson, M. W. (Ed), Dalton, J. P. (Ed) (2011). The book cover is displayed next to the title. The URL at the bottom of the window is 'www.springer.com/gp/search?query=cysteine&submit=Submit'.



Linguistic Technology Systems



# Document Viewers Augmented With APIs



Another strategy for interactive publications is linking documents with APIs maintained by publishers, or by cultural or educational institutions.


API

Open Folder

View

Instructions

As an example, documents mentioning artifacts held in a museum can provide features to view more information about those museum-pieces through the host institution's API.



## MEDAL

✚ Click the icon to save this object

This is a **Medal**. We acquired it in **1920**. Its m is a part of the **Product Design and Decorativ** department.

Cite this object as

Medal; bronze; 1920-31-1

Row: 0

Column: 0



# Embedded Multimedia

Custom-built A3R document viewers can provide convenient access to multimedia content embedded in or linked to texts — including audio files, videos, and 3D graphics scenes or models.

In this case a video player is launched in a dialog box, floating above the article text. For those reading digital books or articles, videos and other multimedia content can be presented through secondary windows launched via context menus; text and multimedia may thereby be viewed side-by-side.



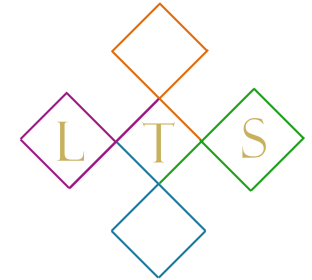
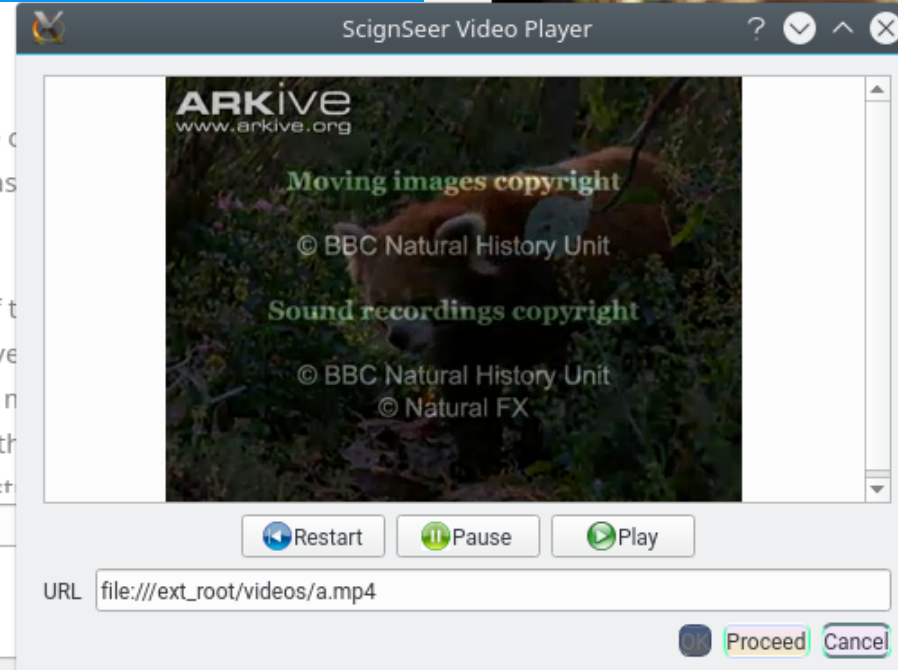
## Behavior

Red pandas are generally solitary, but there are a couple of exceptions. They develop extended associations with their mothers that last through the breeding season.



In terms of behavior, red pandas tend to have a more solitary lifestyle than other species. This may be due to their search for the most suitable habitat, which is patchily distributed.

[ark.org/red\\_panda/about-the-red-panda/](http://ark.org/red_panda/about-the-red-panda/)



Linguistic Technology Systems

