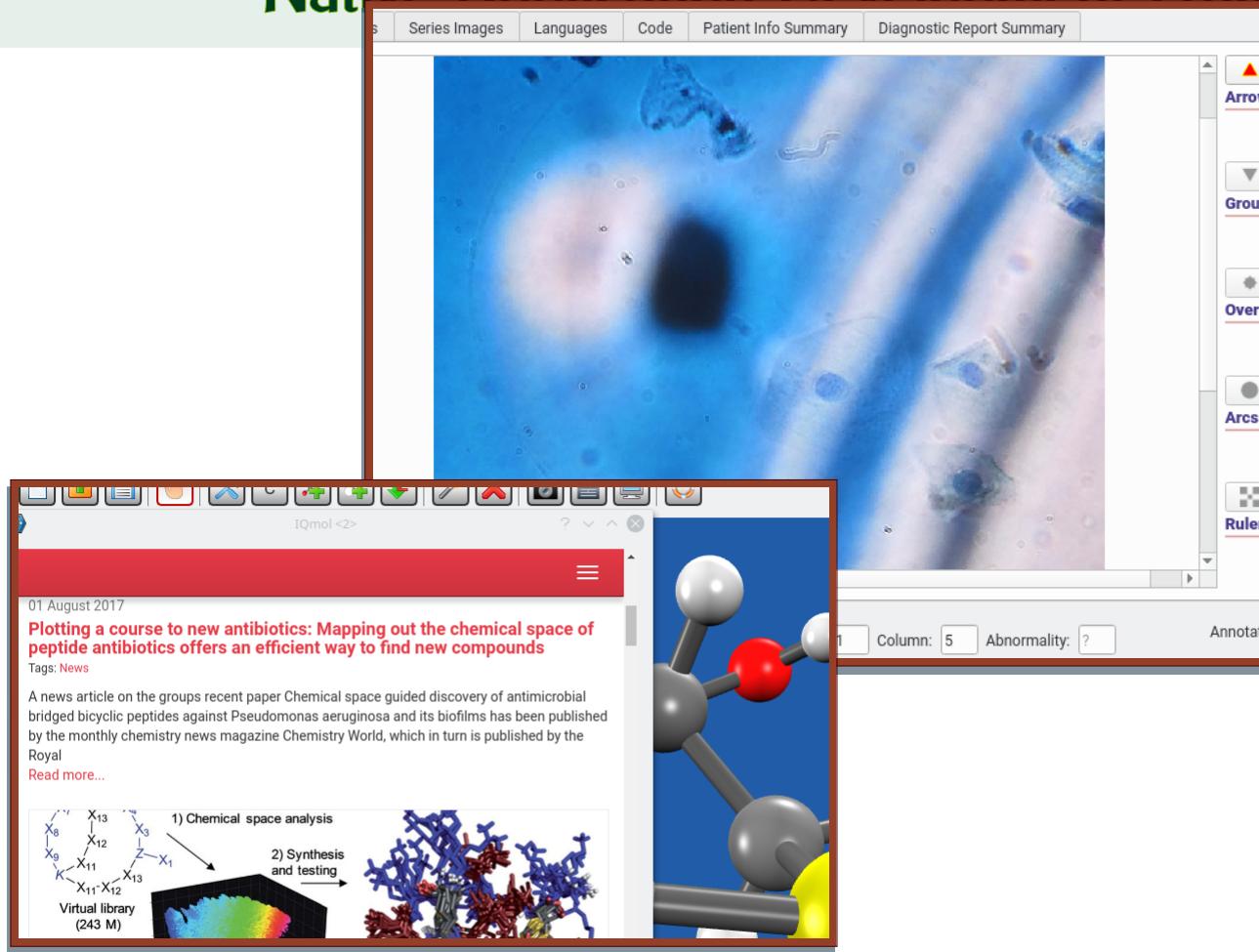


The NCN/A3R ("NA3")

Native Application Development Framework



Linguistic Technology Systems
POC: Amy Neustein, Ph.D.
Founder and CEO
amy.neustein@verizon.net

The NCN (Native Cloud/Native) Protocol

Cloud/Native Components as back-ends for native software

- “Native Cloud/Native” refers to native application front-ends paired with Cloud/Native container instances.
- Share code libraries and data representation across both endpoints.
- Common representation on both server- and client-side streamlines network communications (no need to marshal data between different formats).
- This presentation will focus on NA3’s default Qt implementation, though the technology can be ported to other application frameworks (wxWidgets, XCode, MFC, etc.).

How Cloud Back-Ends Enhance Native Front Ends

- Cloud Backup; Share data between users; Collaborative Editing
- Persist users’ application state across different computers (home/school/office)
- Upgrade running applications without re-compile

Application-As-A-Resource (A3R)

The A3R Application Model

- A3R Applications
- A3R Applications

A3R Developer Tools

- Hypergraph-based data modeling and serialization.
- Framework for building custom scripting, parsing, and data persistence engines.
- Enhanced support for applications specifically designed to access research data sets.

The Qt Ecosystem

Qt is the most popular native, cross-platform application-development framework.

- ◆ ~1 million active developers ◆ Over 5,000 client companies ◆ Worldwide “Qt Partners” Ecosystem ◆ ~US \$250 million overall market

However ... Limited Qt Cloud Integration Support

- “Qt Cloud Services” Discontinued in 2016.
- Currently there is no standard model for accessing Cloud services from Qt applications.
- Nor is there a standard Qt-based Cloud Native container architecture.

Example Use-Cases

Inter-Application Networking and Workflow Management

- Export data and instructions between Qt-based applications (slides e-e).
- Embed document or multi-media viewers inside scientific or dataset applications (slides e-e).

Responsive, desktop-style applications for enhanced UX

- Compelling front-ends for e-commerce, Real Estate, VR, etc. (slides e-e).
- Native applications offer superior User Experience, leveraging distinct interactive features of desktop GUIs: context menus, dialog boxes, tool tips, Multiple Window Display, dock windows, etc.

Interactive VR: Hyperlinked Tag Posts

Panorama-Photography-based VR engines, like Materport, allow “tag posts” with embedded hyperlinks, which in a native-application context become channels of communication between the VR renderer and the host application.

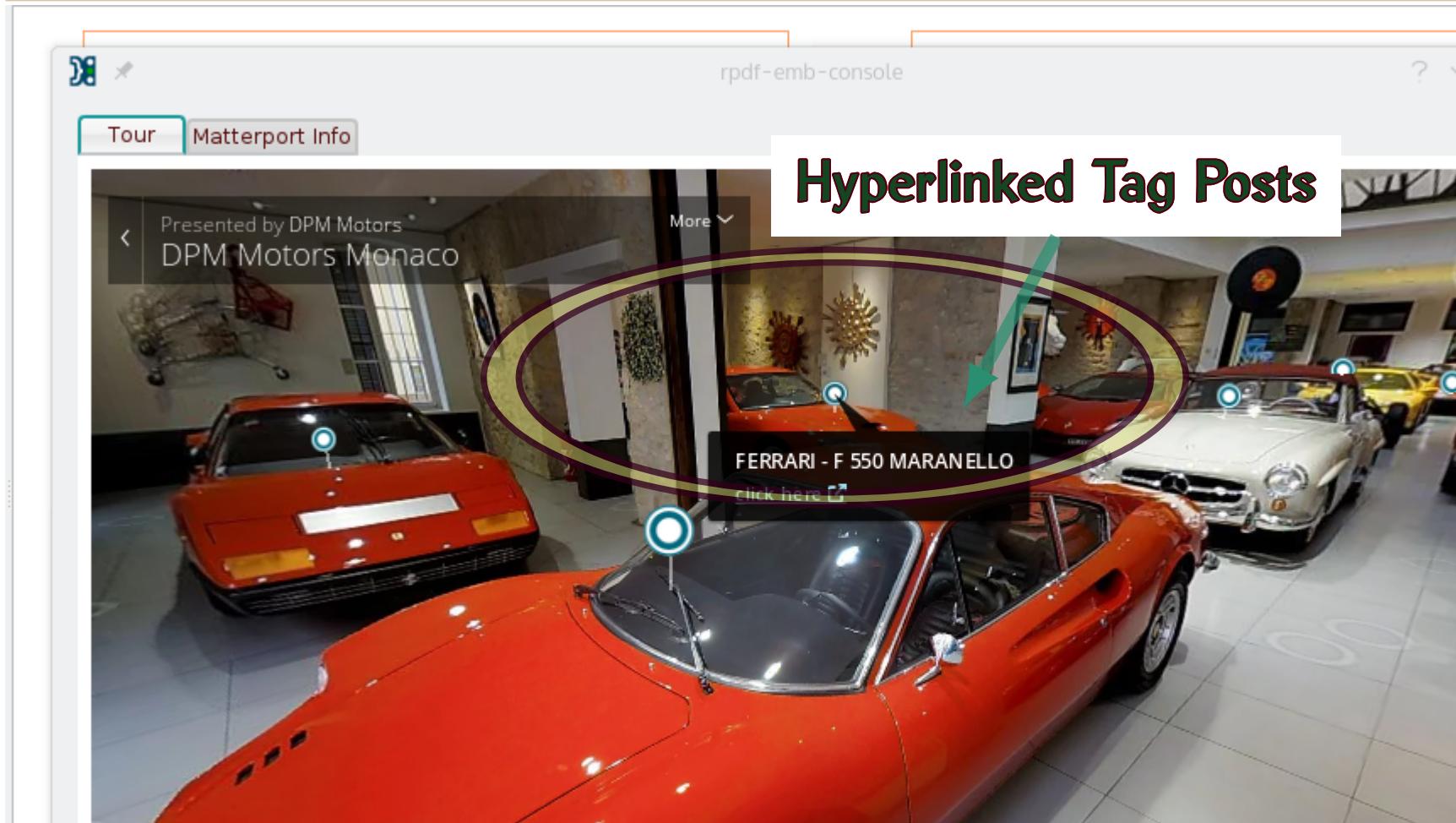


Photo Viewer Color Coding

The Photo Viewer would access embedded data structures which specify how photos are grouped into categories, such as different kinds of rooms (entrance/foyer/hall, kitchen/dining room, bedroom, etc.). Colors are assigned to each group, with color thumbnail used as visual cues marking each photo's classification. Realtors can modify the group names and their corresponding colors, according to their own preferences.

The screenshot shows a photo viewer interface titled "rpdf-emb-console". On the left, there is a grid of small thumbnail images representing various rooms. An arrow points from the "Entrance/Foyer/Hall" entry in the "Groupings" list below to the thumbnail of a hallway in the grid. The "Groupings" list contains the following entries:

- Entrance/Foyer/Hall
- Kitchen/Dining Room
- Living Room/Den
- Bath/Powder Room
- Bedroom/Closet
- Master Bedroom/Spa
- Basement/Game Room

The main right panel displays a large, detailed photograph of a bedroom. The room features a large wooden bed with a headboard, a matching wooden dresser, a chaise lounge, and a pool table. The walls are painted green, and there are windows with valances. A text overlay in the bottom left corner of the main image area says "Current Photo". At the bottom of the screen, there are navigation buttons (left and right arrows), an item counter (Item: 19), an image zoom slider, and two buttons labeled "OK" and "Cancel".

Photo Viewer Interactive Cues

Color insertions switch from horizontal to vertical indicating which photos have been viewed (enlarged). Separate and apart from that, the thumbnail of the current enlarged photo is marked with a thick colored border. This border will surround the thumbnail and the overlay both for photos being viewed for the first time (with a horizontal color-band) and for photos being viewed a second time (with a vertical color-band).

Already Viewed (vertical color band)

Not Yet Viewed (horizontal color band)

Current Photo (viewed for the second time)

/home/nlevisrael/

Groupings

- Entrance/Foyer/Hall
- Kitchen/Dining Room
- Living Room/Den
- Bath/Powder Room
- Bedroom/Closet
- Master Bedroom/Spa
- Basement/Game Room

Item: 10

Image Zoom:

Photo Viewer Alternative Interface

For realtors who prefer showing/hiding thumbnails (as opposed to using color-coding to differentiate groups), the Photo Viewer can also be implemented with this alternative design, or the two designs can be combined. In general, realtors will be afforded a lot of control over the layout and operational design of Re-PDF interactive windows.



Visible Groups

Groupings

- Entrance/Foyer/Hall
- Kitchen/Dining Room
- Living Room/Den
- Bath/Powder Room
- Bedroom/Closet
- Master Bedroom/Spa
- Basement/Game Room

Item: 3

Image Zoom:

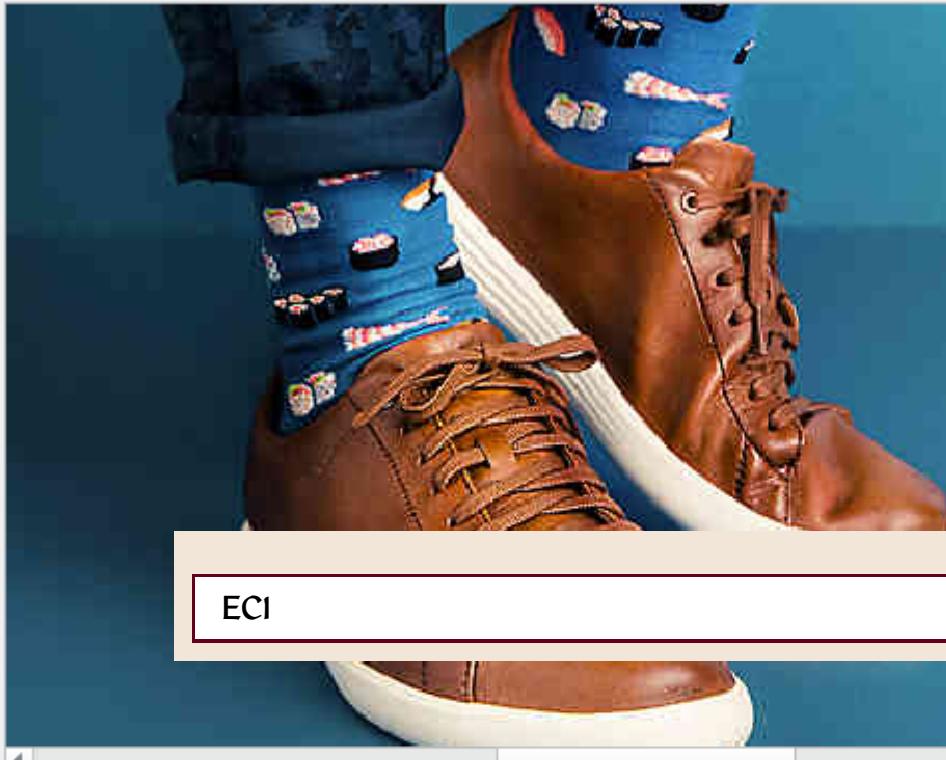
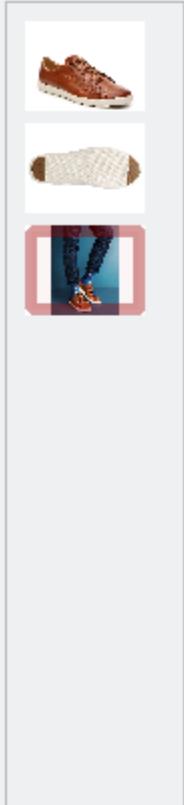
OK



Hidden Groups

EC-I

ECI.



- Detach Image
- Detach Noteboook
- Detach Description
- [Detach Everything](#)
- Merge Windows
- Explore Color Matches ...
- View 3D Model ...
- Take Screenshot
- View Item List
- View Shopping Cart

ECI



Item: 3 Image Zoom:

Grand Cros

Sleek and s
Crosscourt
Haan is the
some tailor
your every

Actions:

- [Add to Cart](#)
- [Explore Similar](#)



Overview Features Specs Reviews

- Leather upper

EC-2

EC2.



EC2

[Overview](#) [Features](#) [Specs](#) [Reviews](#)

Details

Colors: White, Cognac, Navy, Black

Item # 394637

UPC # 190595368293

[Detach Image](#)

[Detach Noteboook](#)

[Detach Description](#)

[Detach Everything](#)

[Merge Windows](#)

[Explore Color Matches ...](#)

[View 3D Model ...](#)

[Take Screenshot](#)

[View Item List](#)

[View Shopping Cart](#)

Grand Crosscou

Sleek and simple, the Crosscourt II sneaker from Cole Haan is the perfect addition to add some tailoring to your everyday style.

Actions:

- [Add to Cart](#)
- [Explore Colors](#)



EC-3

EC3.

The image shows a product customization interface for a brown leather sneaker named EC-3. The main view displays the shoe with three color swatches on the left. A 'Select Color' dialog box is open in the foreground, allowing users to choose a color. The dialog includes a color wheel, sliders for Hue, Saturation, and Value, and numerical inputs for Red (82), Green (42), and Blue (38). The hex code #522a26 is also displayed. The background features a sidebar with 'Product' and 'Coordinate' tabs, and a color calibration strip at the bottom.

Product

Coordinate

Select Color

Hue

Sat

Value

Red

Green

Blue

EC3

Reset

Pick

OK

Apply

Cancel

Hex #522a26

Overview Features Specs Reviews

Details

EC-4

EC4.

File Email Events APIs Web Broadleaf

Page: 0

Search for:



Document: 100%



tecs-db-main <2>

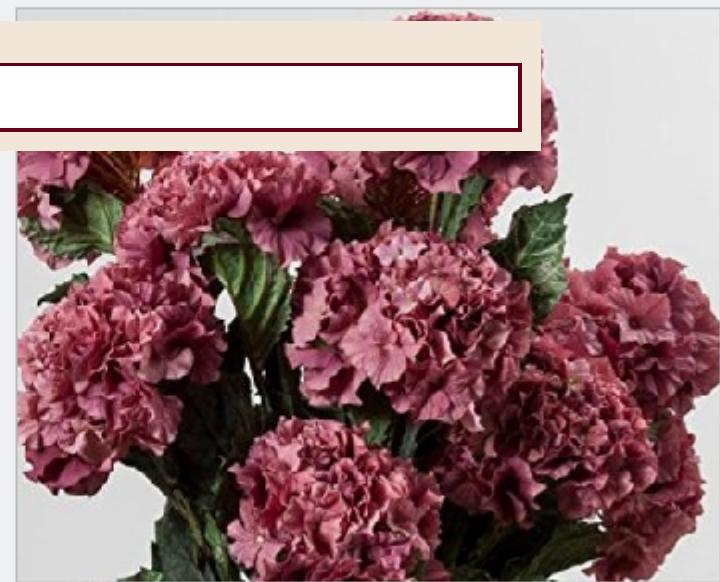
?



tecs-db-main <3>

Lily Garden Silk
Peony Bouquet
Home Decoration,
Lilac, 18 Inches
High

EC4

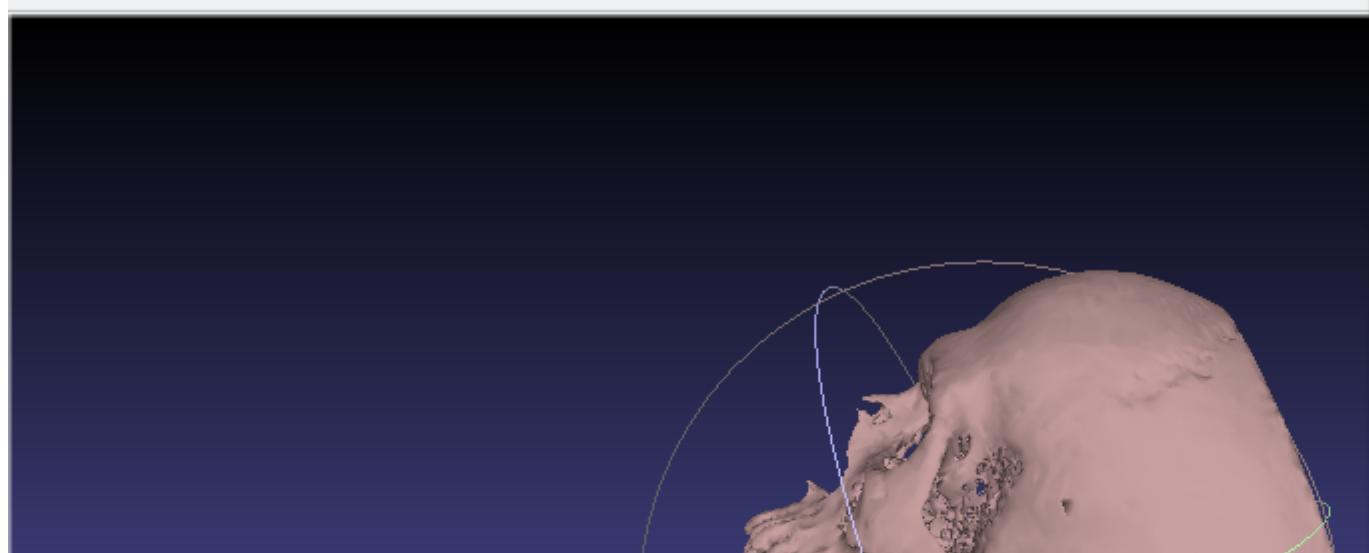


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Hyc
Mai
Incl
Flo

EC-I

ECI.

File Edit Filters Render View Windows Tools Help

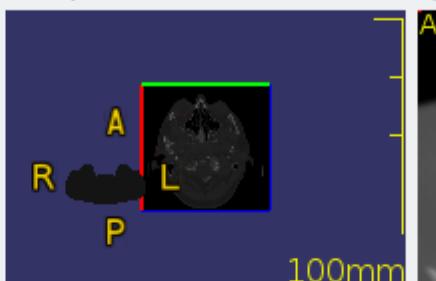


3DimViewer - /ext_r

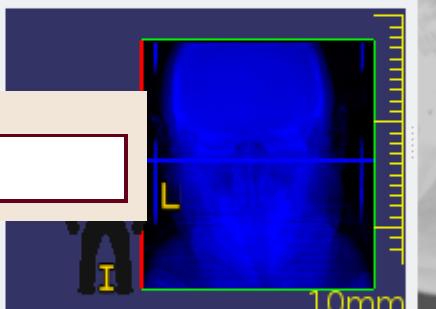
File Edit View Filtering Model



AXial / XY



Coronal / XZ

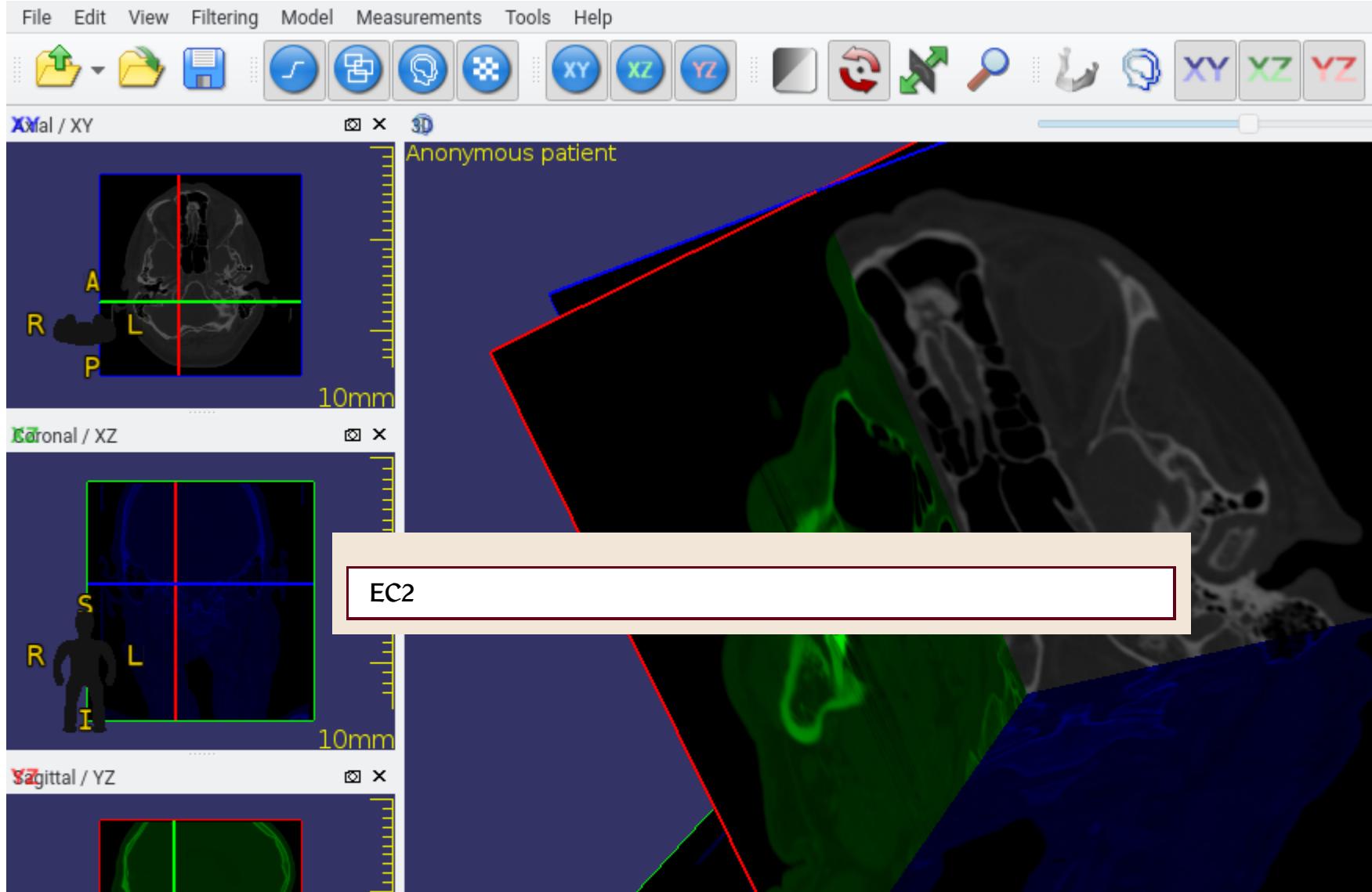


Sagittal / YZ



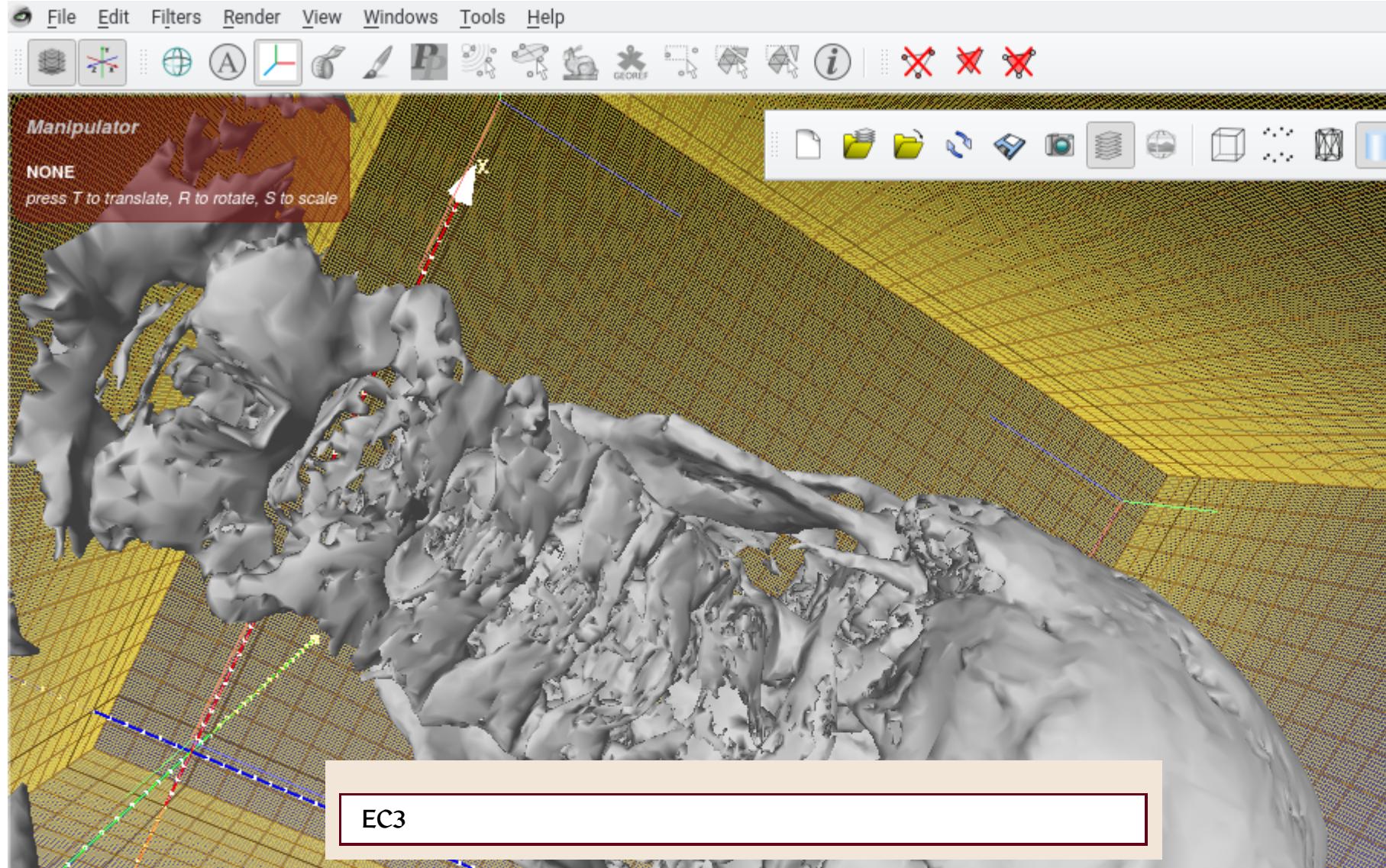
EC-2

EC2.



EC-3

EC3.



ECI.

File Edit Display Build Calculation SONIC Help



Model View

▶ Global

▶ L-cysteine

Configure

Select All

Reperceive Bonds

Duplicate Geometry

Atomic Charges

Remove

SONIC

SONIC Reader

Springer Keyword Search: Cysteine

Springer Web Search Home



Refine Search

Show...

CONTENT
TYPE

Book 157

TOPICS

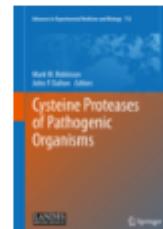
Biochemi
stry 37

Book

Cysteine Proteases of Pathogenic Organisms

Robinson, M. W. (Ed), Dalton, J. P. (Ed) (2011)

Cysteine proteases expressed by pathogenic organisms play key roles in virulence including host



ECI

EC-2

EC2.

The screenshot shows a digital library interface for a journal article. At the top, there are five icons: Open Book, Book Info, Preferences, Library, and Reading. Below the icons is a navigation bar with tabs: PDF, HTML (which is selected), NAV, HTML Source, Lisp, CSS, and XML. A red banner is visible above the main content area. On the left, there's a sidebar with 'Go to old article view' and three icons: PDF, i, and a red square. The main title 'ANTHROPOLOGY AND HUMANISM' is displayed in large brown letters. Below it, a red box contains the identifier 'EC2'. To the right, there's a 'Patterns' section showing a grid of colored rectangles (red, purple, green) and a slider for 'Pattern 1 (3-4-3-4)'. The file path '/extension/ScignSeer/articles/svg/tala.svg' is shown. At the bottom, the article title 'The Ethnographer as Apprentice: Embodying Sociomusical Knowledge in South India' is displayed, along with the author 'Amanda Weidman', publication date 'First published: 26 December 2012', and a link to 'Full publication history'. A DOI link is also present. The right side of the interface includes a volume indicator ('Volume 3 December Pages 2') and a small thumbnail of the journal cover.

ScignSeer SVG Vi

Display Tala Types: Jhoomra/Dhamar (14 beats)

Patterns

Pattern 1 (3-4-3-4)

File /extension/ScignSeer/articles/svg/tala.svg

Volume 3
December
Pages 2

ANTHROPOLOGY AND HUMANISM

EC2

Articles

The Ethnographer as Apprentice: Embodying Sociomusical Knowledge in South India

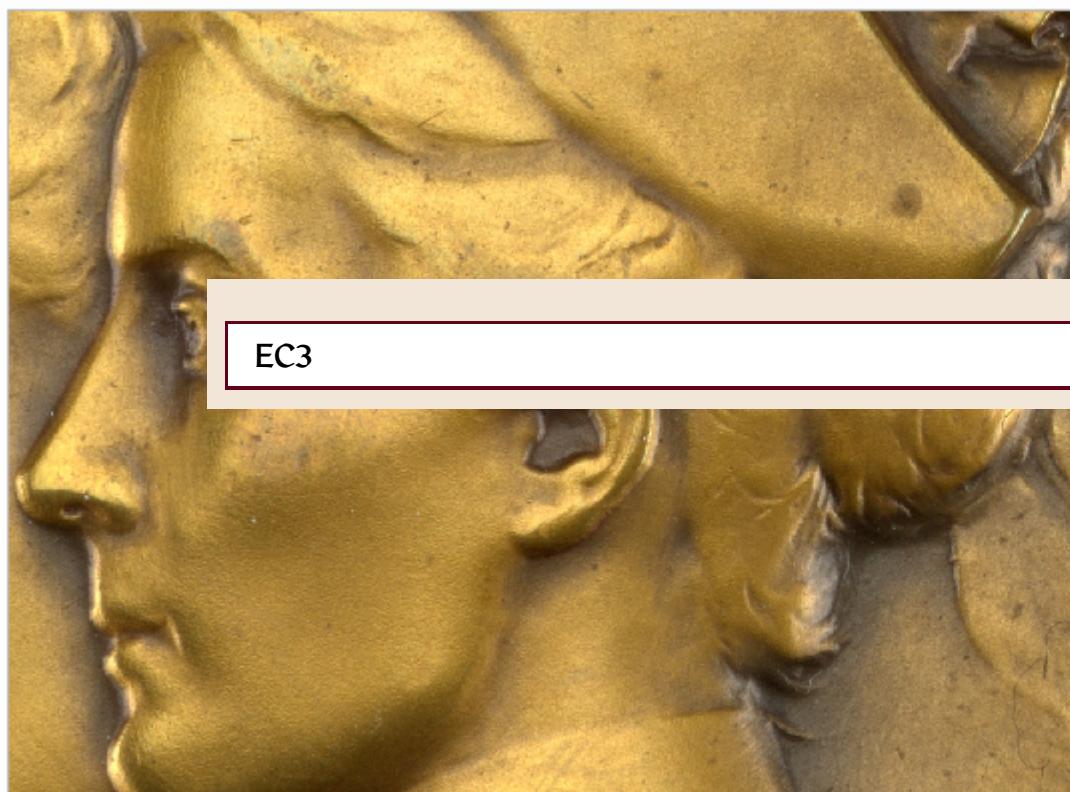
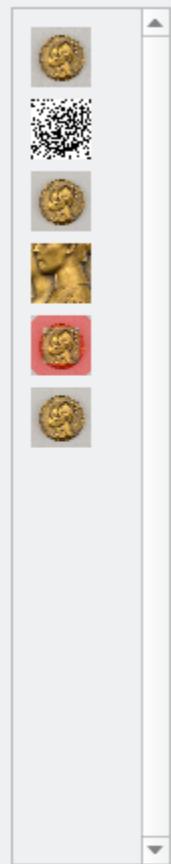
Amanda Weidman

First published: 26 December 2012 Full publication history

DOI: 10.1111/j.1548-1409.2012.01131.x View/Download citation

EC-3

EC3.



[View](#) [Instructions](#)



Row:

0

Column:

0

MEDAL

 Click the icon to save

This is a **Medal**. We acquired

of the **Product D**
department.

Cite this object as

Medal; bronze; 1920-3

EC-4

EC4.

The screenshot shows a digital library interface with various tools and a map of Manhattan. At the top, there are icons for Open Book, Book Info, Preferences, Library, and Reading. Below these are tabs for PDF, HTML (which is selected), NAV, HTML Source, Lisp, CSS, and XML. A sidebar on the left has zoom controls (+, -, X) and a 'Features of the map' section. A search bar says 'Find an address'. The main area displays a detailed map of Manhattan's street grid, with major avenues labeled from Central Park West to Madison Avenue and streets from 1st Street to 106th Street. A red box at the bottom left contains the text 'EC4'.

The screenshot shows a digital document titled 'THE GREATEST GRID' with the subtitle 'THE MASTER PLAN OF MANHATTAN 1811 – NOW'. The title is in large white letters on a black background. Below the title, there are three buttons: 'BEFORE THE GRID', 'THE 1811 PLAN' (which is highlighted in yellow), and 'BUILDING THE GRID'. The main content area shows a historical map of Manhattan's grid system. A red box at the bottom left contains the text 'in 2 - The 1811 Plan.pdf'. A 'Re' button and a 'hide' button are visible in the bottom right corner.

EC-4

EC4.



Open Book



Book Info



Preferences



Library



Reading

PDF

HTML

NAV

HTML Source

Lisp

CSS

XML



**RED PANDA
NETWORK**

Ailurus fulgens styani (also known as *a. f. fulgens*): Only found in China (in the Hengduan Mountains in Sichuan and the East Nujiang River of Yunnan Province) and northern Myanmar.

WHAT WE DO

RED PANDA

GET INVOLVED

CONTRIBUT

Mountains in Sichuan and the East Nujiang River of Yunnan Province) and northern Myanmar.

The head and body length of red pandas averages 56 to 63 cm (22 to 25 in), and their tails about 37 to 47 cm (15 to 19 in).

Behaviors

Red p

EC4

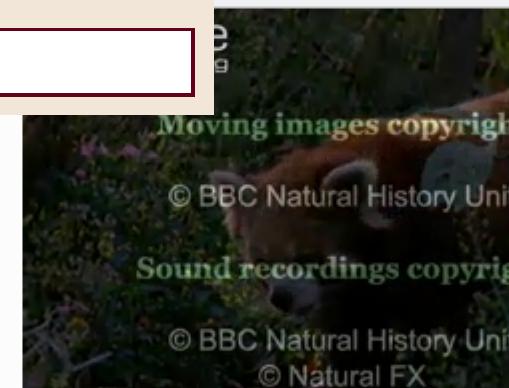
develop extended associations with their mothers that last through the breeding season.



In terms of territoriality, red pandas tend to have overlapping territories with other. This n



ScignSeer Video Player



Moving images copyright

© BBC Natural History Uni

Sound recordings copyright

© BBC Natural History Uni

© Natural FX

EC-4

EC4.

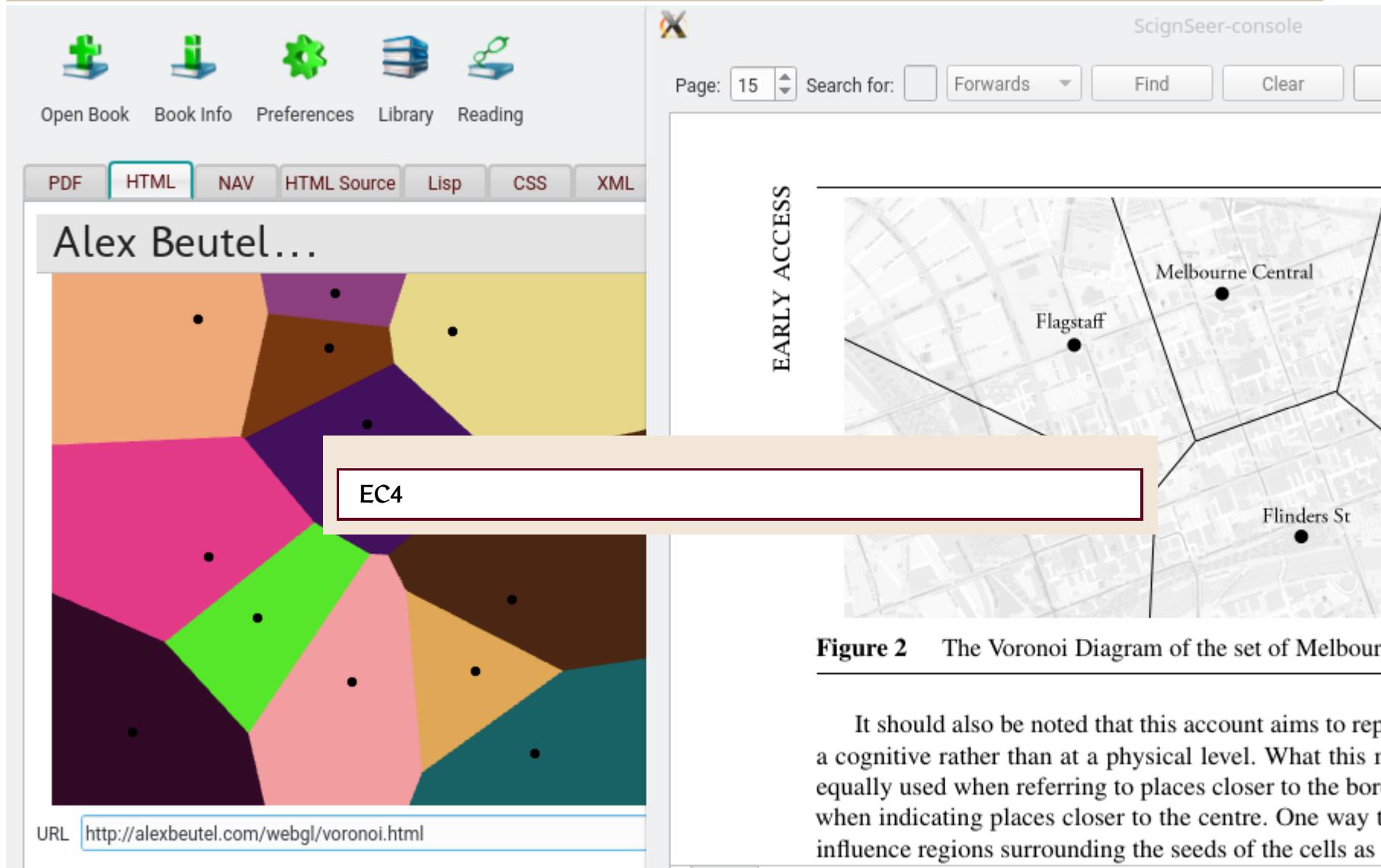


Figure 2 The Voronoi Diagram of the set of Melbourne

It should also be noted that this account aims to represent a cognitive rather than at a physical level. What this means is that the Voronoi diagram can be equally used when referring to places closer to the border of a cell, or when indicating places closer to the centre. One way to do this is to influence regions surrounding the seeds of the cells as follows: