

How Persistent Identifiers Support Open Science

Susanna Mornati
4Science, Italy

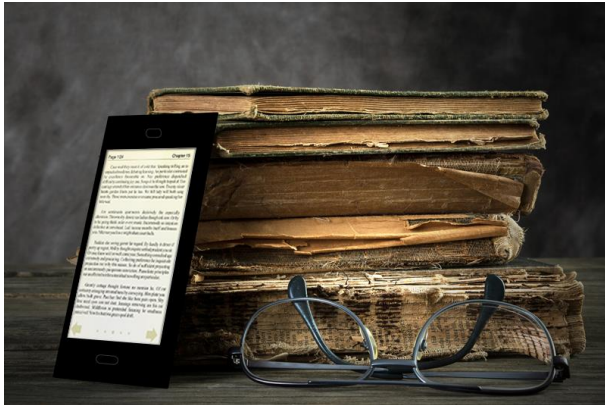
BE-OPEN National Open Science Days, Belgrade, October 18-19, 2018

susanna.mornati@4science.it
www.4science.it

Overview

- Presentation of 4Science
- PIDs in FAIR Principles
- PIDs in OpenAIRE Guidelines
- PIDs in COAR NGR Recommendations
- Use cases:
 - DSpace-CRIS
 - ORCID
 - IRIDE
 - Reviewer Credits

4Science is a European company specialized in solutions for:



Cultural Heritage



**Digital
Preservation**



**Research
Information and
Data Management**

4Science constituted a team of experts who gained decades of domain expertise and experience, both technological and methodological, in data management, resulting from numerous collaborations with universities and research institutes worldwide.





At 4Science, our team since 2003 contributes to open source projects and participates in international communities, developing and promoting open standards that enable interoperability to make Open Science possible.



Signposting



- 4Science is **Certified DuraSpace Partner** for Dspace and DuraCloud
- Participates in the **DSpace Leadership Group**
- Participates in the **DSpace Steering Group**
- Participates in the **Dspace Community Advisory Team (DCAT)**
- Two committers in the **DSpace Committer Group**
- Lead of sub-team **REST API for DSpace 7**
- Participates in **COAR Next Generation Repositories WG** and **Controlled Vocabularies EB**
- Participates in **euroCRIS CERIF & CRIS Architectures TG** and **CRIS & IR TG**

CERTIFIED



PARTNER



DSPACE

DURACLOUD™

Some of our Clients



Some of our solutions



The FAIR Principles

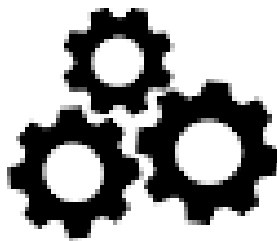
F
Findable



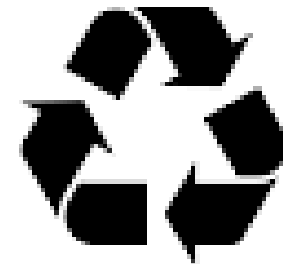
A
Accessible



I
Interoperable



R
Reusable



The FAIR Principles - F

TO BE FINDABLE:

- F1. (meta)data are assigned a globally unique and eternally persistent identifier.
- F2. data are described with rich metadata.
- F3. (meta)data are registered or indexed in a searchable resource.
- F4. metadata specify the data identifier.

The FAIR Principles - A

TO BE ACCESSIBLE:

- A1 (meta)data are retrievable by their identifier using a standardized communications protocol.
- A1.1 the protocol is open, free, and universally implementable.
- A1.2 the protocol allows for an authentication and authorization procedure, where necessary.
- A2 metadata are accessible, even when the data are no longer available.

The FAIR Principles - I

TO BE INTEROPERABLE:

- I1. (meta)data use a formal, accessible, shared, and broadly applicable language for knowledge representation.
- I2. (meta)data use vocabularies that follow FAIR principles.
- I3. (meta)data include qualified references to other (meta)data.

The FAIR Principles - R

TO BE RE-USABLE:

- R1. meta(data) have a plurality of accurate and relevant attributes.
- R1.1. (meta)data are released with a clear and accessible data usage license.
- R1.2. (meta)data are associated with their provenance.
- R1.3. (meta)data meet domain-relevant community standards.

The OpenAIRE Guidelines

Current Guidelines

- [OpenAIRE Guidelines for Literature Repositories](#)
- [OpenAIRE Guidelines for Data Archives](#)
- [OpenAIRE Guidelines for CRIS Managers based on CERIF-XML](#)

New Guidelines Drafts

- [Draft OpenAIRE Guidelines for Literature Repository Managers v4](#)
- [Draft OpenAIRE Guidelines for Software Repository Managers](#)
- [Draft OpenAIRE Guidelines for Other Research Products](#)

The OpenAIRE Guidelines for Literature Repositories

18. Resource Identifier (M)

18.1. DC Field

`dc:identifier`

18.2. Usage

Mandatory

18.3. DCMI Definition

An unambiguous reference to the resource within a given context.

The OpenAIRE Guidelines for Literature Repositories

18.4. Usage Instruction

Recommended best practice is to identify the resource by means of a string or number conforming to a formal identification system. Example formal identification systems include the Uniform Resource Identifier (URI), the Uniform Resource Locator (URL), the Digital Object Identifier (DOI), and the `URN:NBN`.

The ideal use of this element is to use a direct link or a link to a jump-off page (persistent URL) from `dc:identifier` in the metadata record to the digital resource or a jump-off page.

The OpenAIRE Guidelines for Literature Repositories

Smart practice:

- use stable URL's
- provide every identifier one can find about the publication.
 - (URL,DOI,URN:NBN,ISBN,ISSN,etc.)
- place the “most appropriate” identifier in the form of a URL at the top of the list of Identifiers. In almost all cases this is the one that will be used by a service provider to let an end-user refer to. This can be a link to a jump-off page or a direct link to the file. Also this can be a direct URL, or a redirection URL, like PURL, HANDLE or other international resolution mechanisms.

The OpenAIRE Guidelines for Literature Repositories

18.7. Example

In this example the identifiers are sorted so that URLs are given first. The first URL will be considered as “most appropriate” and will be used in e.g. OpenAIRE to let an end-user redirect to. In this case the handle redirects to the jump-off page. A jump-off page is a good way to refer to. The end-user has the opportunity to see more information about the object(s) he has found, see the context and enjoy the other services a local repository has to offer:

```
1 <dc:identifier>http://hdl.handle.net/1234/5628 </dc:identifier>
2 <dc:identifier>http://arno.unimaas.nl/show.cgi?fid=5628 </dc:identifier>
3 <dc:identifier>http://n2t.info/urn:nbn:nl:ui:14123456789</dc:identifier>
4 <dc:identifier>urn:nbn:nl:ui:13-123456789</dc:identifier>
5 <dc:identifier>urn:isbn:123456789</dc:identifier>
6 <dc:identifier>info:doi:10-123456789</dc:identifier>
```

COAR NGR Recommendations



Next Generation Repositories *Behaviours and Technical Recommendations of the COAR Next Generation Repositories Working Group*

November 28, 2017

<https://www.coar-repositories.org/activities/advocacy-leadership/working-group-next-generation-repositories/>



COAR NGR Recommendations

Behaviour 1: Exposing Identifiers

- Many repositories assign persistent identifiers to the scholarly resources they host.
- Since repositories reside on the web, the persistent identifier is expressed as a HTTP(S) URI.
- The persistent HTTP(S) URI is in most cases distinct from the URI of the landing page. As a matter of fact, it typically redirects to the landing page.
- Also, the actual content – say the PDF or the dataset – resides at yet another URI.

COAR NGR Recommendations

- As a result, in many cases, authors refer to resources by means of their landing page URI or the URI of actual content, even though the landing pages of some repositories indicates – in a human-readable manner – that the persistent HTTP(S) URI should be used for referencing.
- When reference managers, annotation tools, or crawlers happen upon a landing page or any other web resource that is part of a scholarly object, they are unable to identify the associated persistent HTTP(S) URI.
- This is rather detrimental as the investment that is made in trying to achieve persistence goes to waste.

COAR NGR Recommendations

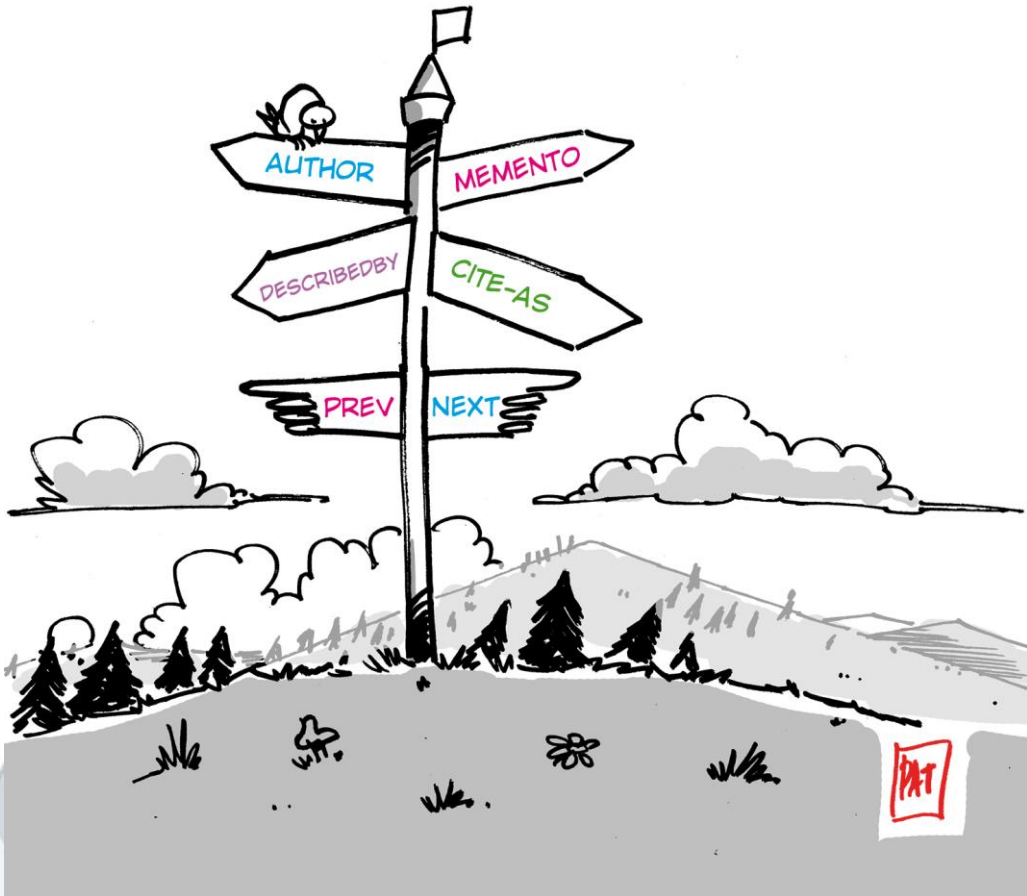
- This problem can be addressed by using typed HTTP links with an appropriate link type (cite-as) to point from web resources that are part of a scholarly object to their persistent HTTP(S) URI.
- This allows tools – potentially even the browser bookmarking tool – to auto-discover the identifier. Authors no longer need to bother to copy/paste the identifier from the landing page. And the persistence intended by these identifiers is achieved.

The technology to make this happen is called **Signposting**

Signposting the Scholarly Web

<http://signposting.org/>

“Signposting is not a formal standardization effort. It's just an accumulation of ideas from people that have spent a lot of time thinking about the web and scholarly communication on the web, working on specifications to improve on the interoperability status quo, and witnessing some specifications being adopted and others not.”



Signposting the Scholarly Web

- Signposting is an approach to make the scholarly web more friendly to machines.
- It informs machine agents about the nature of the resources that are linked from the resource they currently interact with.
- Signposting can be used to support automatic discovery of a variety of resources that pertain to a scholarly object, including a bibliographic description, a persistent identifier, a license, authors, or various resources that are part of the object.

Signposting the Scholarly Web

- It uses typed links (in the HTTP Link header, the HTML element, or the rs:In ResourceSync element) to reveal patterns that occur repeatedly in scholarly portals.
- For resources of any media type, these typed links are provided in [HTTP Link headers](#). For HTML resources, they are additionally provided in [HTML link elements](#).

Signposting the Scholarly Web

HTTP/1.1 303 See Other

Server: Apache-Coyote/1.1

Vary: Accept

Location: <http://www.dlib.org/dlib/november15/vandesompel/11vandesompel.html>

**Link: <<http://orcid.org/0000-0002-0715-6126>> ; rel="author",
<<http://orcid.org/0000-0003-3749-8116>> ; rel="author"**

Expires: Tue, 31 May 2016 17:18:50 GMT

Content-Type: text/html;charset=utf-8

Content-Length: 217

Date: Tue, 31 May 2016 16:38:15 GMT

Connection: keep-alive

Signposting the Scholarly Web

- When visiting scholarly portals, readers can easily figure out landing pages, links to bibliographic records, authorship, etc. But, because portals use different conventions to convey such patterns, machines have a hard time finding their way around.
- As a portal administrator or operator of scholarly infrastructure, you can change that by implementing some of the Signposting patterns listed on this site. Doing so will allow machines to navigate scholarly portals in a uniform manner. Which will lead to applications that make things easier for readers too.



DSPACE
CRIS

DSpace-CRIS

DSpace-CRIS is an “**extended**” version of DSpace, the most adopted repository platform in the world.

It has a powerful and flexible **data model** to describe not just publications, but **all the entities** that populate the research environment and their meaningful **relationships**.

<https://wiki.duraspace.org/display/DSPACECRIS/DSpace-CRIS+Home>
(documentation)

<https://dspace-cris.4science.it/> (demo)

Open solution for research information management

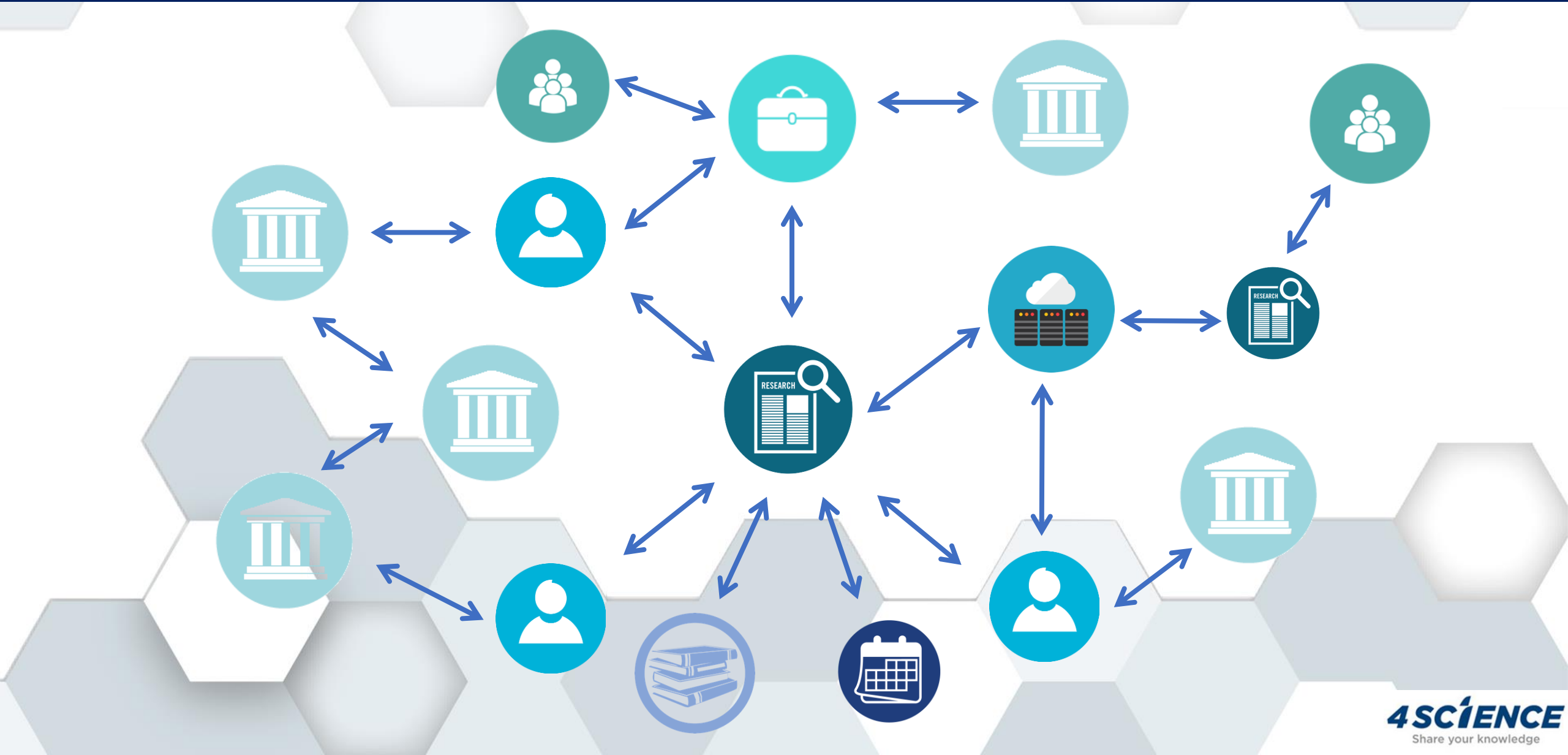
DSpace-CRIS is **free, open source**, compliant with **open standards, open protocols, open technologies**.

It provides institutions with a **sustainable and effective** tool to **manage research information** such as: researchers' profiles, department pages, project grants & awards, research outputs, patents, theses, metrics, reports, statistics, etc.

Now adopted in 6 continents:

<https://wiki.duraspace.org/display/DSPACECRIS/DSpace-CRIS+Users>

An integrated view of the research ecosystem



Advanced user interface

- State-of-art technology for your UI (next: version 7 with AngularJS UI)
- Adaptive, responsive
- Icons for intuitive exploration
- Widgets for most viewed, most cited, etc.

The screenshot displays the Ktisis website, an open access institutional repository for the Cyprus University of Technology. The header includes the logos for 'ΚΤΙΣΙΣ' (Institutional Repository) and 'Τεχνολογικό Πανεπιστήμιο Κύπρου' (Cyprus University of Technology). A navigation menu lists categories such as Home, Communities & Collections, Research Outputs, Researchers, Faculty & Departments, Theses, Patents, Projects, and Help. A 'Sign on to:' button is visible in the top right corner.

The main content area features a 'Welcome to Ktisis' message, a search bar, and three primary exploration widgets: 'People' (327), 'Faculty & Departments' (22), and 'Publications, books, articles...' (2544). Below these are three featured article widgets: 'Recent Submissions', 'Most Viewed' (1,838), and 'Most Cited' (1,948).

Accompanying the main content are two promotional banners: 'THE WORLD UNIVERSITY RANKINGS' and 'THE YOUNGEST AMONG THE TOP EUROPEAN UNIVERSITIES'. The footer contains the '4SCIENCE' logo with the tagline 'Share your knowledge'.

Researcher's profiles with PIDs

The University of Hong Kong
The HKU Scholars Hub 香港大學學術庫

Home Publications Researchers Organizations Grants Datasets Theses Patents Community Service

Chan, DTM

Collaborations Bibliometrics Email Alert (for New Additions) RSS (for New Additions)

Profile

- Contact Information
 - Biography
 - Honours, Awards & Prizes
 - Professional Societies
- Publications [Export](#)
 - Selected Publications (9)
 - Articles (390)
 - Conference Papers (223)
 - Books Edited (2)
 - Book Chapters (15)
 - Others (3)
- External Relations
 - Knowledge Exchange Activities
 - Invited Lectures & Keynote Speeches
 - Editorship
 - Community Service
- Patents
 - Patents (3)

Contact Information

Professor Chan, Daniel Tak Mao 陳德茂



Tel: 2255 4041

Office: QMH PB408 

Title: Chair Professor and Chief of Nephrology
Yu Chiu-Kwong Professorship in Medicine; and Professor:
Chair of Medicine
Professor (Clinical)
Yu Chiu-Kwong Professorship in Medicine
Professor: Chair of Medicine

Department: Department of Medicine

Faculty: Li Ka Shing Faculty of Medicine

Research Interests: (click to check for cognate researchers)

- Treatment and immuno-pathogenesis of lupus nephritis
- Management of viral hepatitis in immunosuppressed patients with kidney diseases

My URLs:

- Personal Page
- <http://orcid.org/0000-0002-3495-4051>

Also Cited As: Chan, TM
Chan, Tak-mao, Daniel

Research outputs with PIDs

Ktisis at Cyprus University of Technology / Cyprus University of Technology Repository / Άρθρα/Articles

Please use this identifier to cite or link to this item: <http://ktisis.cut.ac.cy/handle/10488/7613>

Title: A strong regioregularity effect in self-organizing conjugated polymer films and high-efficiency polythiophene: fullerene solar cells

Authors: Choulis, Stelios A. 
Kim, Youngkyoo 
Cook, Steffan 

Keywords: Polymers
Fullerenes
Nanostructured materials
Plastic films
Solar cells

Issue Date: 2008

Publisher: Nature

Source: Nature materials, 2008, Volume 5, Issue 3, Pages 197-203

Abstract: The influence of polymer regioregularity (RR) on the molecular nanostructure, and on the resulting material properties and device performance was analyzed. Annealed blend films show increased α regardless of RR, that indicates improved charge-carrier diffusion. It was found that the highest device efficiencies will be achieved with the highest RR P3HT. It was also found that the dark-current density of as-fabricated devices made with pristine P3HT increases with the RR of P3HT in the higher voltage regime

URI: <http://ktisis.cut.ac.cy/handle/10488/7613>

ISSN: 1476-1122 (print)
1476-4600 (online)

DOI: 10.1038/nmat1574

SCOPUS[™]
Citations

1,805 

checked on Apr 8, 2017

WEB OF SCIENCE[™]
Citations

1,759 

checked on May 11, 2017

Page view(s)

234 

Last Week
11

Last month
50

checked on Jun 12, 2017



Google Scholar[™]

Check



Altmetric

Collaboration networks

Researcher



Kalogirou, Soteris A.
Department: Department of Mechanical Engineering and Materials Science and Engineering

AND

Cognate Researcher

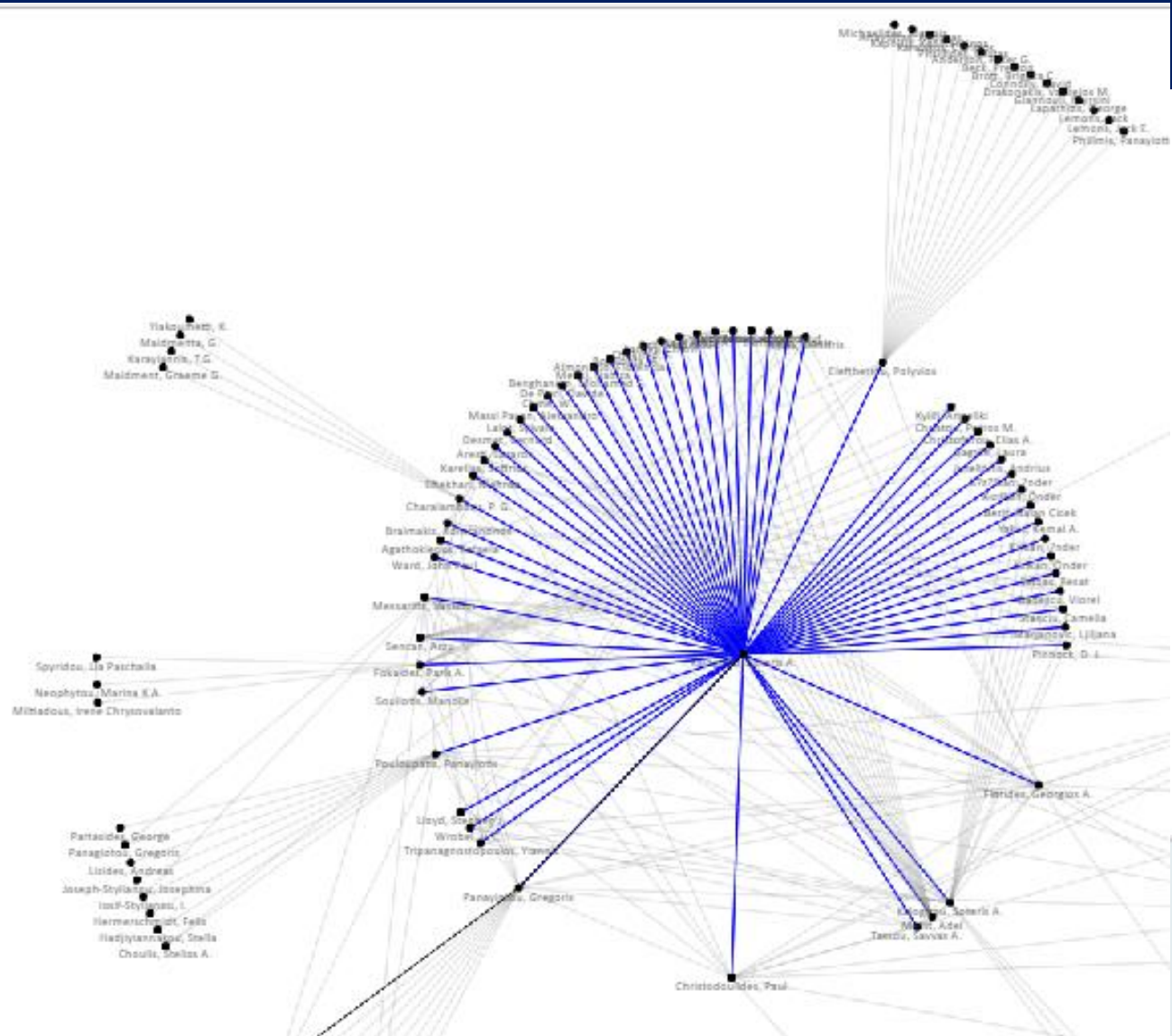


Panayiotou, Gregoris
Department: Department of Mechanical Engineering and Materials Science and Engineering

SHARE

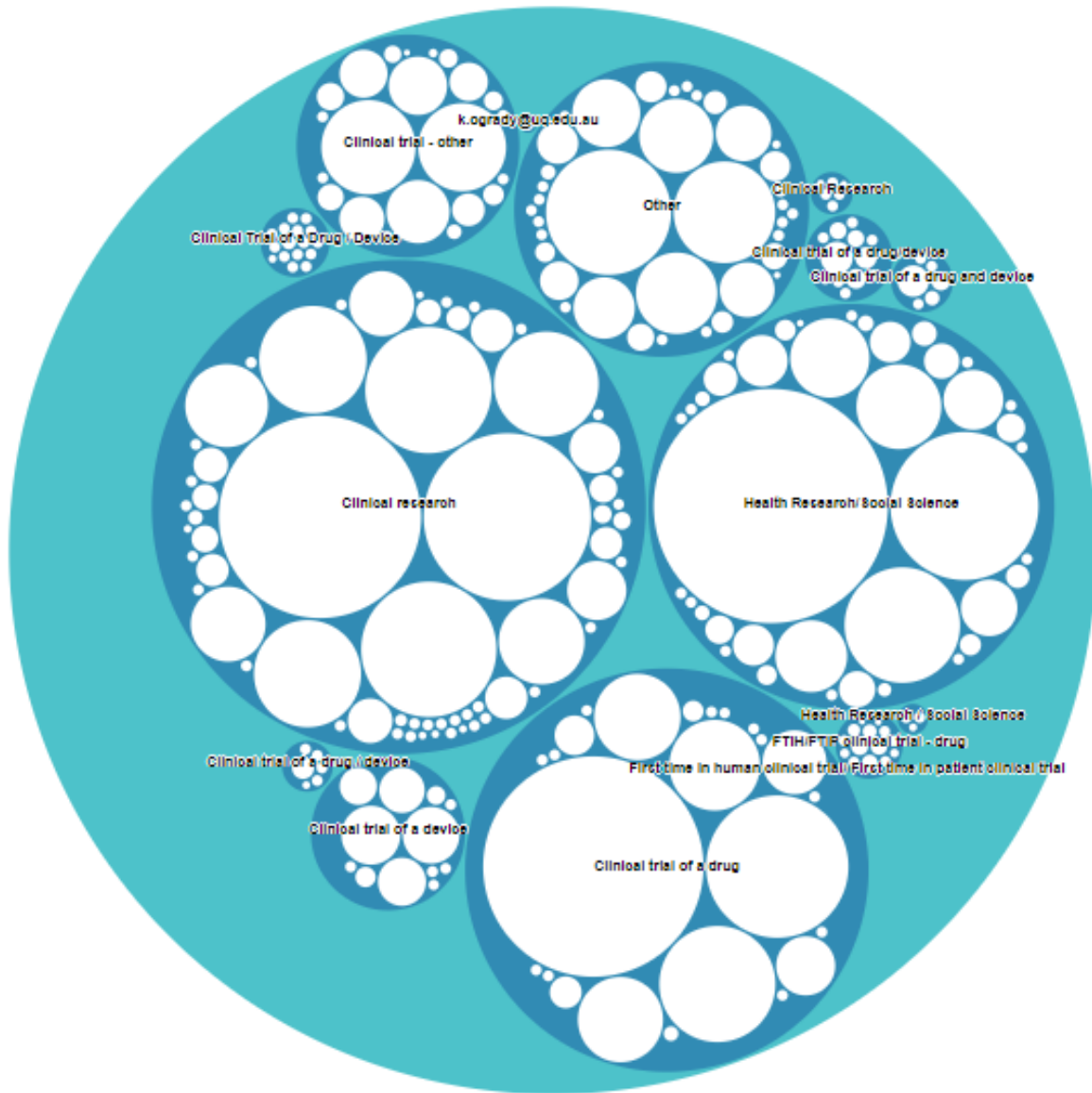
Research Facets

- Co-authored publications: 11



Cyprus
University of
Technology

Project keywords graph (circle packing)



Queensland Health
(new example
from the community
In Australia)

Interoperability & Persistent Identifiers

- Bibliographic/bibliometric import from ORCID, CrossRef, ArXiv, PubMed, Scopus™, WebOfScience™, ADS, ...
- Integration with local IDM for authentication&authorization, HR system for researchers/organizational units info, hidden proprietary CRIS
- Export to data warehouse, to enable combined analytics with other institutional information
- OAI-PMH export to OpenAIRE and other specialized aggregators
- SEO (Search Engine Optimization)
- **Support for PIDs for any entity (researchers, publications, journals, projects, funders, etc.)**

New features of DSpace-CRIS - 2018

- ORCID API v.2 (push/pull of profiles, publications, projects)
- Core Recommender / Signposting / ResourceSync (funded by OpenAIRE)
- Integration with OpenAIRE projects database
- Support for next OpenAIRE Guidelines for Data Archives (Datacite 4.1) (funded by OpenAIRE)

Make your research FAIR with Dspace-CRIS

DSpace-CRIS (the free open-source CRIS solution) provides a persistent identifier of the digital objects (handle/DOI) (F) and supports other PIDs, such as ORCID (I). A machine-readable (Signposting) landing page provides access to indexed and searchable (Solr, SEO, Microformat, Google Scholar metatags) metadata, data files, licenses, and version information (F, A, R).

Make your research FAIR with Dspace-CRIS

DSpace-CRIS is integrated with CKAN: deposits can include metadata, data files, and any complementary files (such as documentation or code) needed to understand the data. Tabular data are exposed as open data for M2M interaction **(R)**. Metadata can be public, even if the data are restricted **(F, A)**.

Make your research FAIR with Dspace-CRIS

Metadata are available at the resource and file levels, and domain-specific schemas and vocabularies can be adopted.

Metadata can be exposed through a variety of methods (OAI-PMH, ResourceSync) and formats (including CERIF).

(I, R)



ORCID

Connecting Research
and Researchers

ORCID provides a persistent digital identifier that distinguishes you from every other researcher and, through integration in key research workflows such as manuscript and grant submission, supports automated linkages between you and your professional activities ensuring that your work is recognized.

<https://orcid.org/>

IRIDE (Italian Researcher IDentifier for Evaluation)

- Announcement:
- We are delighted to announce that Italy will be implementing ORCID on a national scale, and has signed a three-year consortium membership agreement with ORCID. Under the auspices of ANVUR and CRUI (the Conference of Italian University Rectors), 70 universities and four research centers will initially participate in the consortium. This large-scale adoption will underpin the IRIDE (Italian Researcher IDentifier for Evaluation) Project, using a platform developed by Cineca. The project's goal is to ensure that at least 80% of Italian researchers have an ORCID iD, with links to their research output back to 2006, by the end of 2016.
- <https://orcid.org/blog/2015/06/19/italy-launches-national-orcid-implementation>

IRIDE (Italian Researcher IDentifier for Evaluation)

- What happened:
 - By November 2015 (one year before the deadline), 98% of researchers at the Italian Universities participating in the project (against 80% of the original goal) had an ORCID!

(I'm very proud to have been the Director of this project)



ReviewerCredits



<https://www.reviewercredits.com/>

ReviewerCredits

What is ReviewerCredits?

- The place to get credit for your peer review and conference activity

The case

- Up until now, **the peer review activity has not been recognized and certificated** in a standardized way.
- Today, it is really hard to keep track of the reviews performed, and scientists generally add into their CV a vague sentence stating that they are reviewers for a number of Journals; this declaration is almost void, as it cannot be verified and, as said, does not give an idea of the amount of work spent.

ReviewerCredits

How does it work?

- At ReviewerCredits, each review performed and claimed is validated by the Editorial Offices of Journals, and added in a certificate, automatically generated from members accounts, reporting, for each year, the number of reviews performed for each Journal.
- Individual membership is free of charge. Anonymity of the review process is maintained as neither the title nor the authors of manuscripts are requested when filling the claim.
- A REST API is under development to allow retrieving peer review data automatically using the ORCID.

Where to find us
next?

DuraSpace
Summit
USA
April 2019

German DSpace
User Group
Meeting
Bamberg
April 2019

Open
Repositories
Hamburg
10-13 June
2019

And more
to come!

Thanks for your attention!

Susanna Mornati

susanna.mornati@4science.it

skype: susanna.mornati

linkedin: susannamornati

orcid: 0000-0001-9931-3637

www.4science.it