

# Método Bili

## Uma otimização da Bibliometria

**Anderson Queiroz**

Senai Cimatec  
Centro de Competência em Robótica e  
Sistemas Autônomos  
[anderson.vale@fbter.org.br](mailto:anderson.vale@fbter.org.br)



Como vocês realizam as buscas por artigos?

WEB OF SCIENCE



ORCID



RESEARCHERID

Scopus®



researchfish

SRI

Surrey Research Insight

MENDELEY



THE CONVERSATION



Academia.edu

share research



ResearchGate

Google™  
Scholar



PUBLONS  
EVALUATING ACADEMIC RESEARCH

# Pouco tempo para muito resultado

A screenshot of a Google Scholar search results page. The search term 'artigos importantes' is entered in the search bar. The results are filtered to show 'Artigos' (Articles). There are approximately 600,000 results. The results are listed in a grid format with titles, authors, and publication details.

Google Scholar search results for 'artigos importantes'.

Artigos

A qualquer momento

Desde 2021

Desde 2019

Desde 2017

Período específico...

Classificar por relevância

Classificar por data

Ver como artigo

Preparar páginas em Português

incluir patentes

incluir citações

Clear filters

Search results (600,000)

Artigos

prox. Etapas de busca e seleção de artigos em revistas sistemáticas da literatura

... Scopus.org

prox. Estudos de revisão sistemática: um guia para síntese científica

... Scopus.org

prox. Importância do uso correto dos descritores nos artigos científicos

... Scopus.org

A screenshot of a Scopus search results page. The search term 'solar energy' is entered in the search bar. The results are displayed in a table format with columns for Document title, Authors, Year, Source, and Cited by. The first result is a research article titled 'Cu/G photocathodes with band-tail states assisted hole transport for tandem solar water splitting' by Peng, L., Xu, Y., Yao, L., ... Gitzel, M., Hegedus, A., published in Nature Communications in 2020, with 0 citations.

Scopus

Search Sources Lists SciVal > Library catalogue >

105,248 document results

TITLE:ABS:KEY ('solar energy')

Edit Save Set alert Set feed

Search within results...

Refine results

Access type:

- Open Access (10,738) >
- Other (94,509) >

Year:

- 2020 (1,589) >

Documents Secondary documents

Analyze search results

Click on Analyze search results to view search results displayed in various graph formats

View Mendeley Data (120k) Search your library

Sort by: Date (newest)

Export Download View citation overview Save to list ...

Document title Authors Year Source Cited by

Cu/G photocathodes with band-tail states assisted hole transport for tandem solar water splitting Peng, L., Xu, Y., Yao, L., ... Gitzel, M., Hegedus, A. 2020 Nature Communications 11(1), 188 0

View abstract View full text View at Publisher Related documents

A screenshot of a search results page for 'dynamic path planning'. The search term is entered in the search bar. The results are shown in a grid format with filters for Conferences, Journals, Magazines, Books, Courses, and Early Access Articles. The first result is a conference paper titled 'An Extension of Dynamic Programming Algorithm in Robotic Path Planning' by Shanshan Ji, Lianhe Yang, published in 2012, with 0 citations.

Search within results...

Showing 1-25 of 6,301 for Dynamic path planning

Conferences (5,245)

Journals (948)

Magazines (49)

Books (6)

Courses (1)

Early Access Articles (45)

Show

- All Results
- Open Access Only

Select All on Page

Sort By: Relevance

An Extension of Dynamic Programming Algorithm in Robotic Path Planning

Shanshan Ji, Lianhe Yang  
2012 International Conference on Computer Science and Service System  
Year: 2012 | Conference Paper | Publisher: IEEE  
Cited by: Papers (1)

Abstract 0 Read (319 KB)

Dynamic programming field based environment learning and path planning for mobile robots

Yuan Yuan; Zhiqiang Cao; Zengqiang Hou; Min Tan

# Tempo e precisão

A tecnologia existe para ajudar a nós tornar cada vez mais rápidos e precisos no que fazemos.

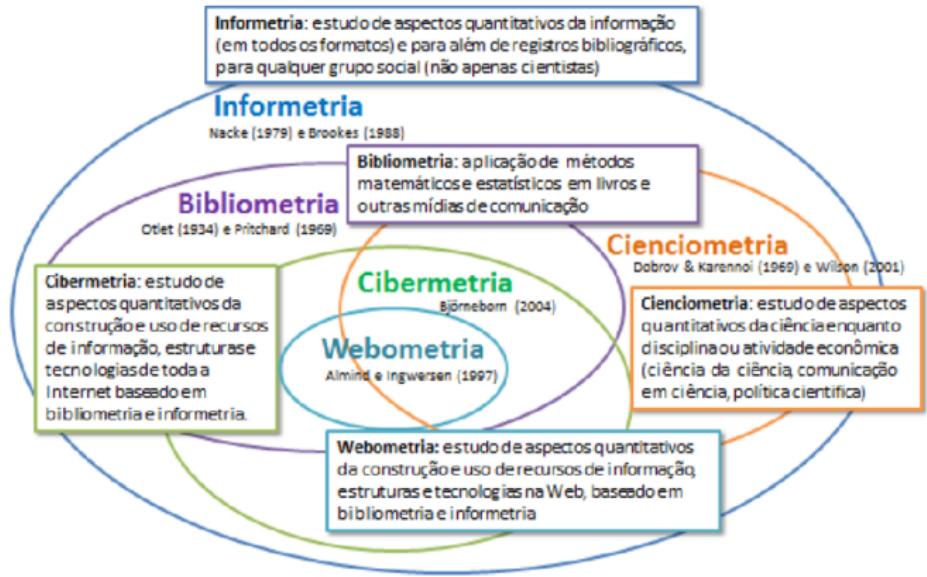
Fatores que impulsiona a ser rápido e preciso:

- ▶ Competitividade
- ▶ Prazo de entrega
- ▶ Concluir um trabalho



# Existe algum método para melhorar a busca de artigos?

- ▶ Biblioteconomia
- ▶ Método BiLi

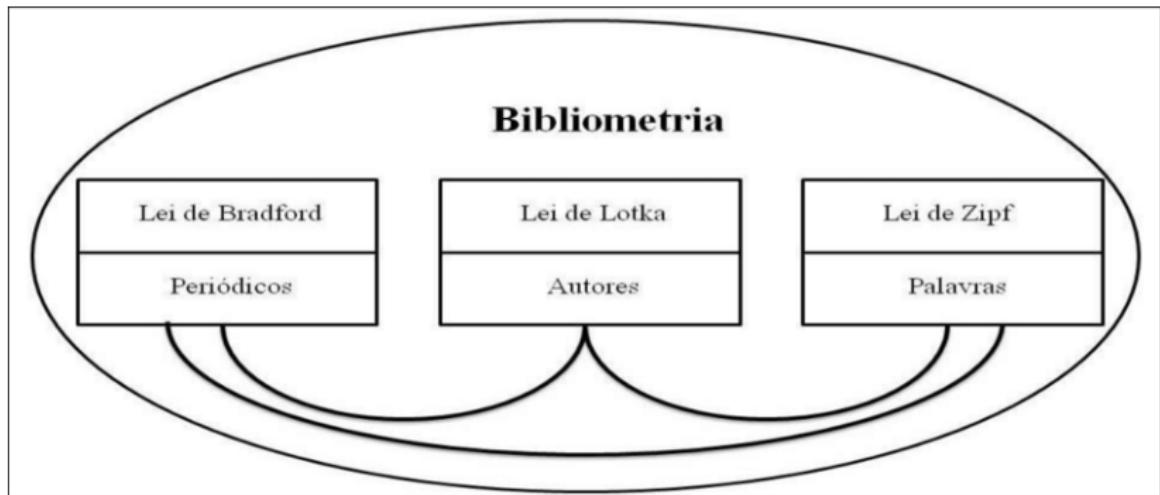


# Bibliometria

- ▶ Aplica métodos estatísticos e matemáticos para analisar e construir indicadores sobre a dinâmica e evolução da informação científica e tecnológica.
- ▶ Medir o desenvolvimento, a qualidade e o impacto de uma série de artigos escolhidos.
- ▶ Paul Otlet, 1934



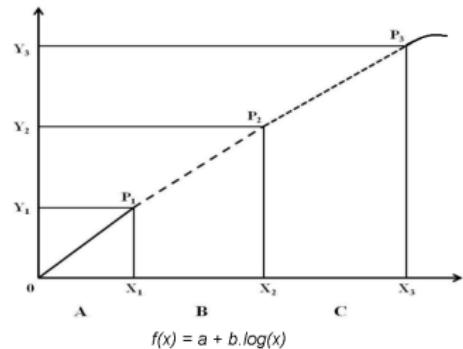
# Três leis básicas



# Lei de Bradford

## Lei da dispersão

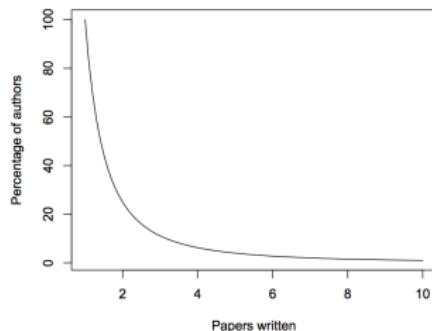
- ▶ Medir produtividade das periódicos
- ▶ Estabelecer núcleo e as áreas de dispersão
- ▶ Permite fazer a estimativa do grau de relevância de revistas de conhecimentos



# Lei de Lotka

## Lei do quadrado inverso

- ▶ Produtividade dos autores
- ▶ Relação entre o número de autores e o número de artigos publicados
- ▶ Estabelecer núcleo e as áreas de dispersão
- ▶ Permite fazer a estimativa do grau de relevância de revistas de conhecimentos
- ▶ Define as maiores contribuições dos pesquisadores

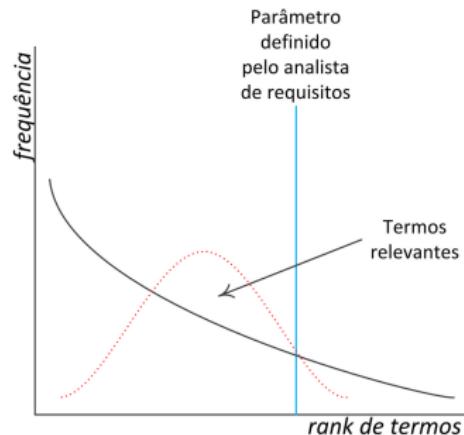


$$Y = \frac{C}{X^n}$$

# Lei de Zipf

## Lei do menor esforço

- ▶ Trata e mede a frequência de ocorrência de palavras em vários textos
- ▶ As palavras mais usadas indicam o assunto



# Fator de Impacto

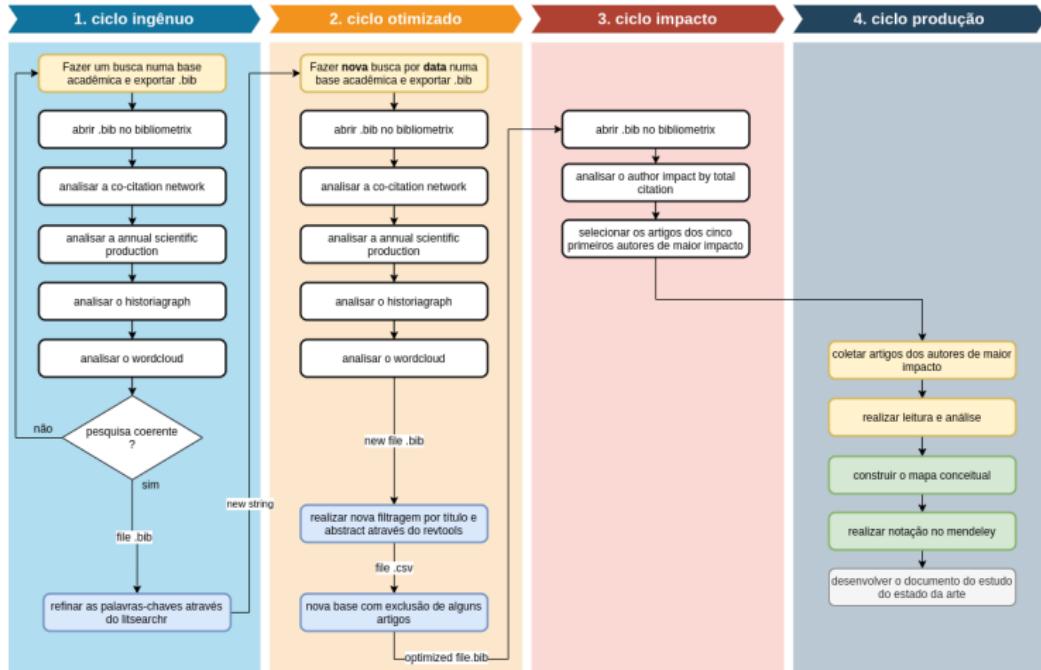
Medida que reflete o número médio de citações de artigos científicos publicados.  
Avaliar a importância de um dado periódico em sua área.



# Principais estudos da Bibliometria

Leis e Princípios	Focos de Estudo	Principais Aplicações
Lei de Bradford	periódicos	estimar o grau de relevância de periódicos, em dada área do conhecimento
Lei de Lotka	autores	estimar o grau de relevância de autores, em dada área do conhecimento
Leis de Zipf	palavras	indexação automática de artigos científicos e tecnológicos
Fator de Imediatismo ou de Impacto	citações	estimar o grau de relevância de artigos, cientistas e periódicos científicos, em
Acoplamento Bibliográfico	citações	estimar o grau de ligação de dois ou mais artigos
Co-citação	citações	estimar o grau de ligação de dois ou mais artigos
Obsolescência da Literatura	citações	estimar o declínio da literatura de determinada área do conhecimento
Vida-média	citações	estimar a vida-média de uma unidade da literatura de dada área do conhecimento

# Método BiLi

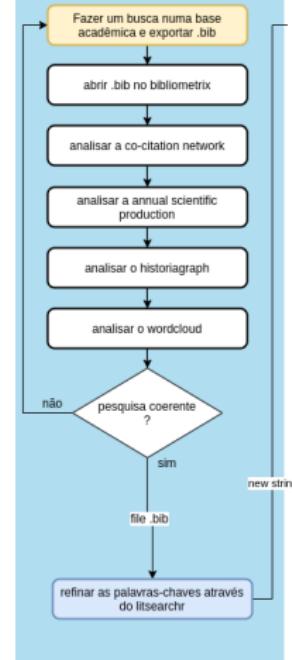


## Pré-Requisito

- ▶ Ter instalado o R  $\geq 3.5$ 
  - ▶ Windows - <https://cran.r-project.org/bin/windows/base.old/3.5.0/>
  - ▶ Ubuntu 18.04 - <https://rtask.thinkr.fr/installation-of-r-3-5-on-ubuntu-18-04-its-and-tips-for-spatial-packages/>
- ▶ Dentro do Console do R instalar:
  - ▶ Bibliometrix - `install.packages(bibliometrix)`
  - ▶ LitSearchR - `remotes::install_github("elizagrames/litsearchr", ref="main")`
  - ▶ RevTools - `install.packages(revtools)`

# 1º Ciclo

## Ciclo Ingênuo



# 1º Ciclo - Busca

Fazer uma busca em uma base acadêmica e exportar .bib

- ▶ Web Of Science
- ▶ Scopus
- ▶ Dimension
- ▶ PubMed
- ▶ Cochrane Library

The screenshot shows a search interface for 'Robot development'. The main panel displays search results for conferences (21,349), journals (3,064), books (N/A), magazines (0), and courses (0). A 'Show' dropdown is set to 'All Results'. A specific result is highlighted: 'Development of a robot simulation system for remotely operating training and robot performance verification' by Kuan-Chi Hwang, Kai-Jen Suata, Ming-Chih Lin, and Yen-Chieh Hwang, presented at the 2011 IEEE International Conference on Robotics and Automation.

The 'Reportar resultados' (Export) dialog box is open, showing options for exporting to various formats like EndNote, BibTeX, and CSV. It also includes an 'Escolher' (Select) section for choosing specific items or all results.

# 1º Ciclo - Bibliometrix

## Abrir o Bibliometrix no R

Atividades RStudio ▾

File Edit Code View Plots Session Build Debug Profile T

+ Go to file/function Addins ▾

Console Terminal Jobs

```
> library(bibliometrix)
To cite bibliometrix in publications, please use:

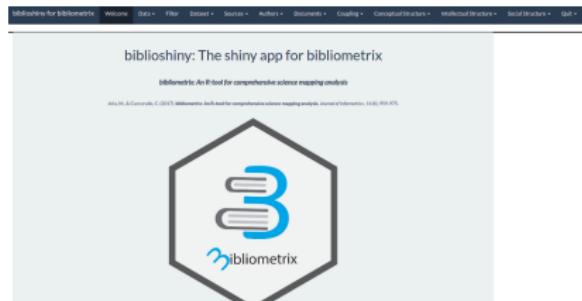
Aria, M. & Cuccurullo, C. (2017) bibliometrix: An R-tool for comprehensive science mapping analysis, Journal of Informetrics, 11(4), pp 959-975, Elsevier.
```

<http://www.bibliometrix.org>

Help us to keep Bibliometrix free to download and use by contributing with a small donation to support our research team (<https://bibliometrix.org/donate.html>)

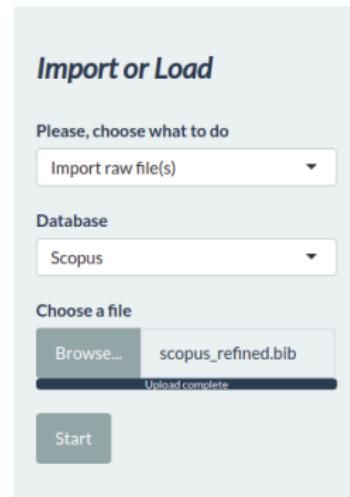
To start with the shiny web-interface, please digit:  
biblioshiny()

```
> biblioshiny()
```



# 1º Ciclo - Bibliometrix

## Importar o .bib



# 1º Ciclo - Bibliometrix

## Visualização dos dados importados

Welcome Data Filter Dataset Sources Authors Documents Coupling Conceptual Structure Intellectual Structure Social Structure

Quit

**Import or Load**

Please, choose what to do

Import raw file(s) Database Scopus Choose a file Browse... scopus\_refined.bib Upload complete Start

Show 50 rows Print Search:

DOI	AU	DE	ID	C1	CR	JI
<a href="https://doi.org/10.1007/978-981-15-4917-5_35">10.1007/978-981-15-4917-5_35</a>	MAT DARUS IZAL-KHAFAJI AAM	CUCKOO SEARCH ALGORITHM; FLEXIBLE UNDERWATER MANIPULATOR; FLOWER POLLINATION ALGORITHM; PID CONTROLLER	BIOMIMETICS; ELECTRIC CONTROL EQUIPMENT; FLEXIBLE MANIPULATORS; HEURISTIC METHODS; MOTION PLANNING; OPTIMIZATION; PARAMETER ESTIMATION; PROPORTIONAL	UNIVERSITI TEKNOLOGI MALAYSIA, JOHOR BAHRU, JOHOR, 81310, MALAYSIA	DARUS, I.Z.M., ZAHIDI RAHMAN, T.A., MAILAH, M., EXPERIMENTAL EVALUATION OF ACTIVE FORCE VIBRATION CONTROL OF A FLEXIBLE STRUCTURE USING SMART MATERIAL	SMART II SYST. TEC
<a href="https://doi.org/10.1109/CMA49215.2020.9233983">10.1109/CMA49215.2020.9233983</a>	HE J, WEI Y, ZHAO Y, ZHENG Z, FU J	ACTIVE DISTURBANCE REJECTION CONTROL; ADRC; TERMINAL SLIDING MODE CONTROL; UNDERWATER	DISTURBANCE REJECTION; MANIPULATORS; ACTIVE DISTURBANCE REJECTION CONTROL; EXTERNAL DISTURBANCES; FLOW	HARBIN ENGINEERING UNIVERSITY, DEPARTMENT OF AUTOMATION, HARBIN, 150001, CHINA	GUSEV, A.L., GOLOVINA, E.S., ABOUT THE DEVELOPMENT OF A TECHNOLOGICAL COMPLEX WITH A MANIPULATOR FOR AN UNMANNED UNDERWATER VEHICLE (2019) IOP CONFERENCE	IEEE INT. MECHATRONIC AUTOM.

# 1º Ciclo - Bibliometrix

## Analisar o Co-Citation Network

The screenshot shows the Bibliometrix software interface with the following details:

- Top Navigation Bar:** Welcome, Data, Filter, Dataset, Sources, Authors, Documents, Coupling, Conceptual Structure, Intellectual Structure (selected).
- Sub-navigation Bar:** Graph, Table, Degree Plot (selected).
- Right Panel Sub-navigation:** Co-citation Network (selected), Historiograph.
- Left Panel:** **Co-citation Network** section with buttons: Apply!, Save Pajek, Save Fig.
- Network Parameters:**
  - Field:** Papers (dropdown menu).
  - Field separator character:** ";" (Semicolon) (dropdown menu).

1º Ciclo - Bibliometrix

## Analisar o Co-Citation Network

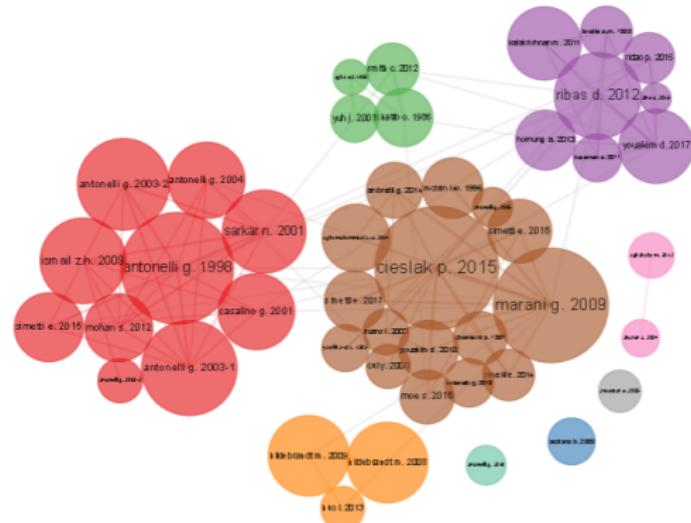
The screenshot shows the 'Co-citation Network' interface. At the top, there's a navigation bar with tabs: Welcome, Data, Filter, Dataset, Sources, Authors, Documents, Coupling, Conceptual Structure, and Intellectual Structure. The 'Intellectual Structure' tab is currently selected. Below the navigation bar, there are three tabs: Graph (selected), Table, and Degree Plot. On the left, there's a sidebar titled 'Co-citation Network' with several configuration options:

- Buttons for 'Apply!', 'Save Pajek', and 'Save Fig'.
- A section titled 'Network Parameters:' with a dropdown for 'Field' set to 'Papers'.
- A dropdown for 'Field separator character' set to ';' (Semicolon).
- A section titled 'Network Layout' with a dropdown for 'Automatic layout'.
- A section titled 'Clustering Algorithm' with a dropdown for 'Louvain'.
- A section titled 'Node Shape' with a dropdown for 'Circle'.

In the center, there's a large network graph where nodes represent documents or papers. Nodes are colored by cluster and have labels like 'Borod J. 2009', 'Kernell G. 2000', 'mohamed N. 1994', 'han J. 2012', and 'Vitello A. 2011-1'. Edges connect nodes, representing co-citations. At the bottom center is a green circular icon with an upward-pointing arrow.

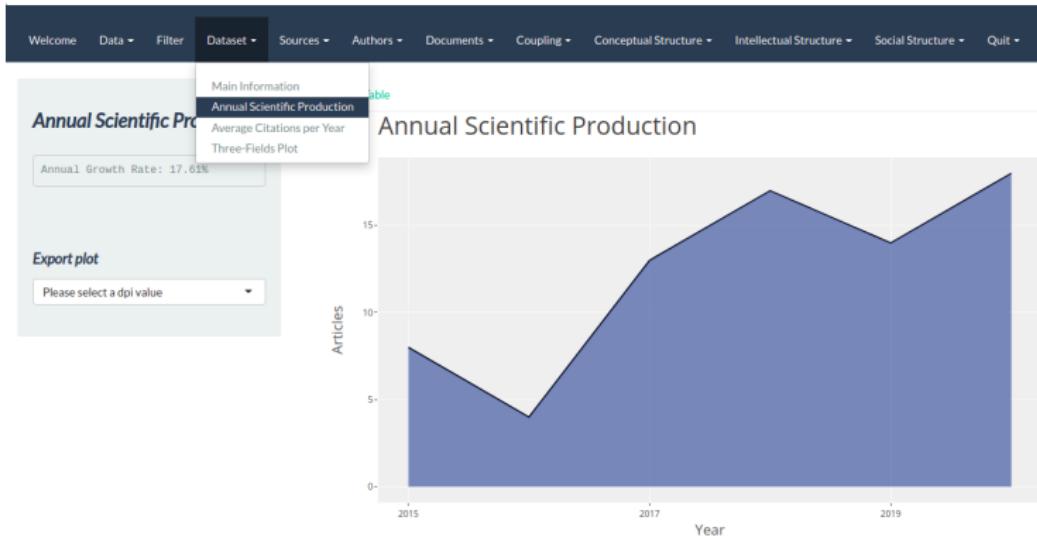
# 1º Ciclo - Bibliometrix

## Analizar o Co-Citation Network



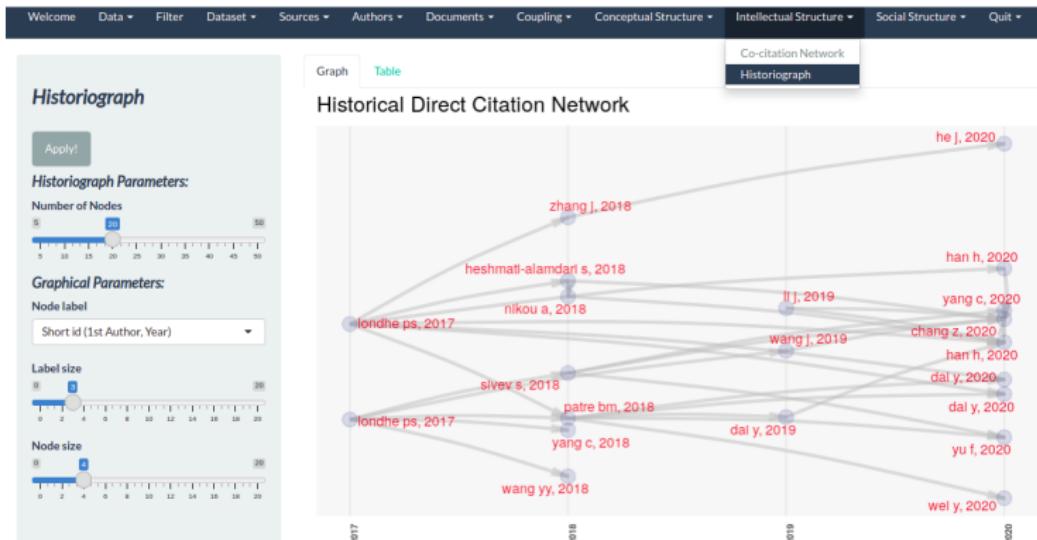
# 1º Ciclo - Bibliometrix

## Analizar o Annual Scientific Production



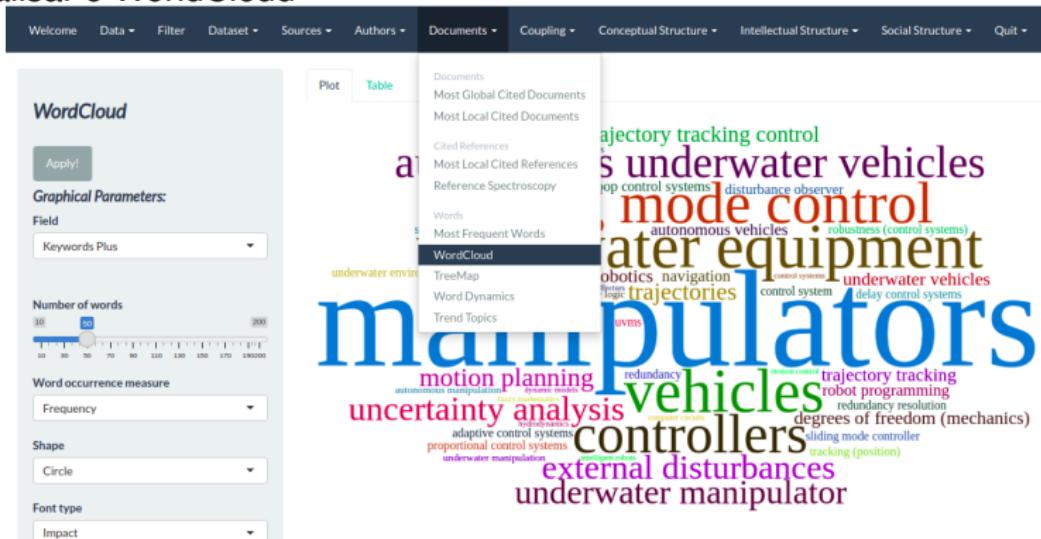
# 1º Ciclo - Bibliometrix

## Analisar o Historiograph



# 1º Ciclo - Bibliometrix

## Analisar o WorldCloud



# 1º Ciclo - Bibliometrix

Analisar o WorldCloud



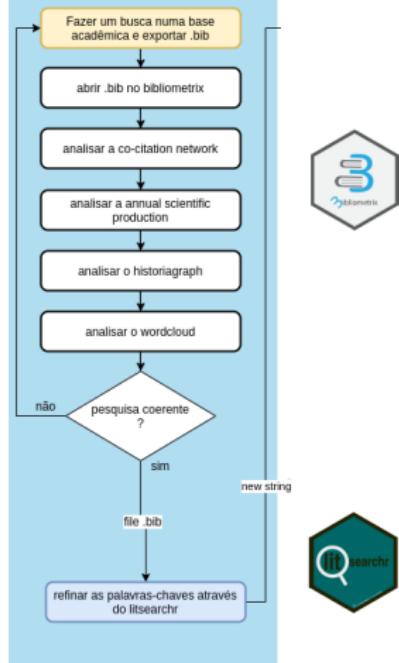
# 1º Ciclo - Bibliometrix

## Analisar o WorldCloud



# 1º Ciclo

## Ciclo Ingênuo



## 1º Ciclo - LitSearchR

É um pacote R para facilitar o desenvolvimento de estratégia de busca quase automática para revisões sistemáticas.

The screenshot shows the RStudio interface. The top panel displays the code for 'litsearch\_scopus12.R'. The code includes several library imports (dplyr, ggplot2, ggraph, igraph, readr, devtools, bibliometrix, litsearchr) and a package version check. It also contains a search string for Scopus using TITLE-ABS-KEY terms. The bottom panel shows the 'Console' tab with the command to install the package from GitHub.

```
library(dplyr)
library(ggplot2)
library(ggraph)
library(igraph)
library(readr)
library(devtools)
library(bibliometrix)
library(litsearchr)
packageVersion("litsearchr")

# Utilizando uma string ingênua de busca para obter um conjunto de artigos relevantes
# ( (TITLE-ABS-KEY ( "visual odometry" ) AND (TITLE-ABS-KEY ( "egomotion" ) OR TITLE-ABS-KEY ( "pose" )
4

267:2 (Top Level) ▾ R Script ▾
```

Console Terminal × Jobs ×

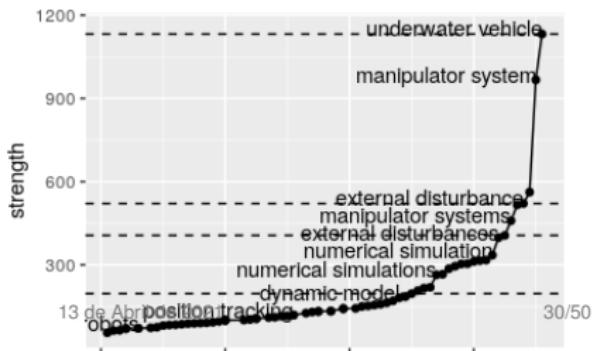
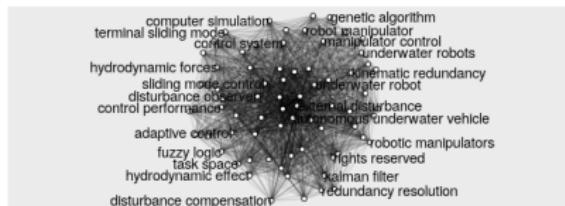
```
~/
> remotes::install_github("elizagrames/litsearchr", ref="main")
```

# 1º Ciclo - LitSearchR

Retorna um novo texto de busca

```
Console Terminal Jobs
~/
This is going to write .txt files to your computer containing the search strings. Are you sure you want to write the files?
1: yes
2: no

Selection: 1
[1] "English is written"
[1] "(\\\"manipulator system\\\" OR \\\"underwater manipulator\\\" OR \\\"vehicle manipulator system\\\" OR \\\"underwater vehicle manipulator system\\\") AND (\\\"underwater manipulator\\\" OR \\\"underwater robot\\\" OR \\\"underwater vehicle\\\" OR \\\"autonomous underwater\\\") AND (\\\"disturbance observer\\\" OR \\\"external disturbances\\\" OR \\\"motion planning\\\" OR \\\"trajectory tracking\\\" OR \\\"sliding mode control\\\"))"
>
```



# 1º Ciclo - LitSearchR

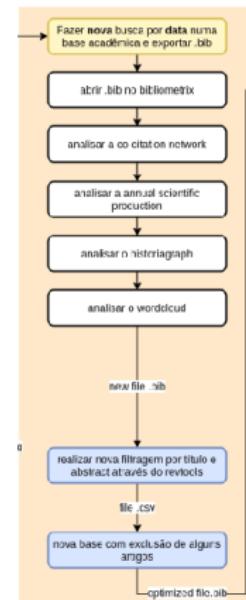
## Refinar palavras chaves

```
Source on Save | Run | Source |   
1 search_directory <- "~/Documentos/AUM/litsearchr_AUM/apresentacao"  
2  
3 stopwrlds <- c("advances", "analyse", "analysed", "analyses")  
4  
5 grouped_terms <- list(  
6   manipulator=selected_terms[c(17, 10, 22, 20)],  
7   underwater=selected_terms[c(10, 11, 13, 12, 15)],  
8   techniques=selected_terms[c(3, 4, 6, 9, 8)]  
9 )  
10  
11 new_search_directory <- "~/Documentos/AUM/litsearchr_AUM/new"  
12  
13 important_titles <- c(  
14   "Collision detection for underwater ROV manipulator systems"  
15 )
```

12:1 (Top Level) R Script

## 2º Ciclo

### Ciclo Otimizado



## 2º Ciclo - Nova Busca



Scopus

Search Sources Lists SciVal ↗



### Advanced search

[Basic  
Search](#)

[Advanced](#)

[Search tips](#)

Enter query string

("manipulator system" OR "underwater manipulator" OR "vehicle manipulator system" OR "underwater vehicle manipulator system") AND ("underwater manipulator" OR "underwater robot" OR "underwater vehicle" OR "autonomous underwater") AND ("disturbance observer" OR "external disturbances" OR "motion planning" OR "trajectory tracking" OR "sliding mode control")

[Outline query](#)   [Add Author name / Affiliation](#)   [Clear form](#)   [Search](#)

## 2º Ciclo - Bibliometrix

### Importar o novo .bib

Welcome Data Filter Dataset Sources Authors Documents Coupling Conceptual Structure Intellectual Structure Social Structure

Quit

Show 50 rows Print Search:

**Import or Load**

Please, choose what to do

Import raw file(s) Database Scopus Choose a file Browse... scopus\_refined.bib Upload complete Start

DOI	AU	DE	ID	C1	CR	JI
<a href="https://doi.org/10.1007/978-981-15-4917-5_35">10.1007/978-981-15-4917-5_35</a>	MAT DARUS IZAL-KHAFAJI AAM	CUCKOO SEARCH ALGORITHM; FLEXIBLE UNDERWATER MANIPULATOR; FLOWER POLLINATION ALGORITHM; PID CONTROLLER	BIOMIMETICS; ELECTRIC CONTROL EQUIPMENT; FLEXIBLE MANIPULATORS; HEURISTIC METHODS; MOTION PLANNING; OPTIMIZATION; PARAMETER ESTIMATION; PROPORTIONAL	UNIVERSITI TEKNOLOGI MALAYSIA, JOHOR BAHRU, JOHOR, 81310, MALAYSIA	DARUS, I.Z.M., ZAHIDI RAHMAN, T.A., MAILAH, M., EXPERIMENTAL EVALUATION OF ACTIVE FORCE VIBRATION CONTROL OF A FLEXIBLE STRUCTURE USING SMART MATERIAL	SMART II SYST. TEC
<a href="https://doi.org/10.1109/CMA49215.2020.9239863">10.1109/CMA49215.2020.9239863</a>	HE J, WEI Y, ZHAO Y, ZHENG Z, FU J	ACTIVE DISTURBANCE REJECTION CONTROL; ADRC; TERMINAL SLIDING MODE CONTROL; UNDERWATER	DISTURBANCE REJECTION; MANIPULATORS; ACTIVE DISTURBANCE REJECTION CONTROL; EXTERNAL DISTURBANCES; FLOW	HARBIN ENGINEERING UNIVERSITY, DEPARTMENT OF AUTOMATION, HARBIN, 150001, CHINA	GUSEV A.L., GOLOVIN A.S., ABOUT THE DEVELOPMENT OF A TECHNOLOGICAL COMPLEX WITH A MANIPULATOR FOR AN UNMANNED UNDERWATER VEHICLE (2019) IOP CONFERENCE	IEEE INT. MECHATRONIC AUTOM.

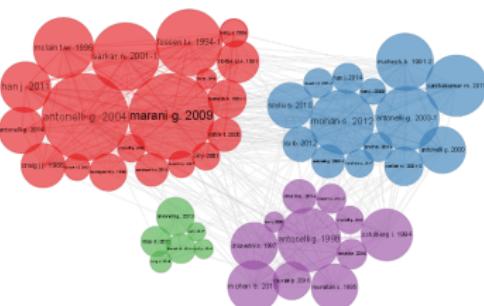
2º Ciclo - Bibliometrix

## Analisar o Co-Citation Network

1º Ciclo



2º Ciclo

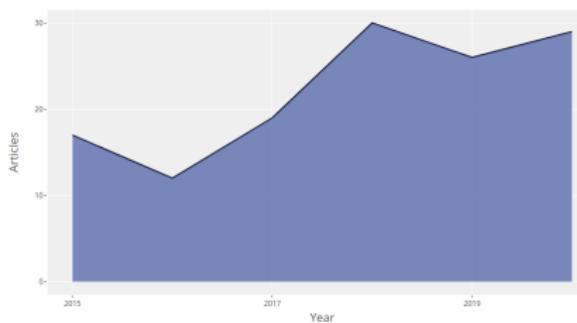


## 2º Ciclo - Bibliometrix

Analisar o novo Annual Scientific Production

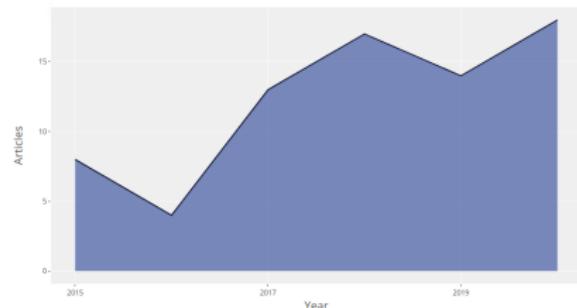
### 1º Ciclo

Annual Scientific Production



### 2º Ciclo

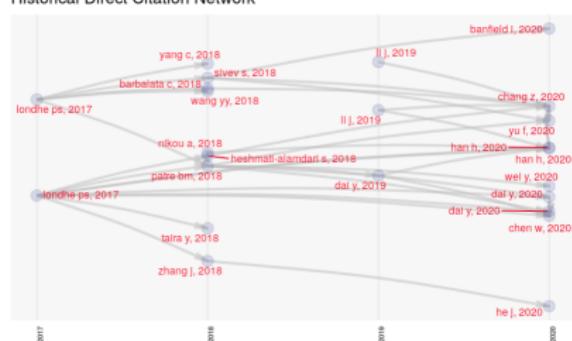
Annual Scientific Production



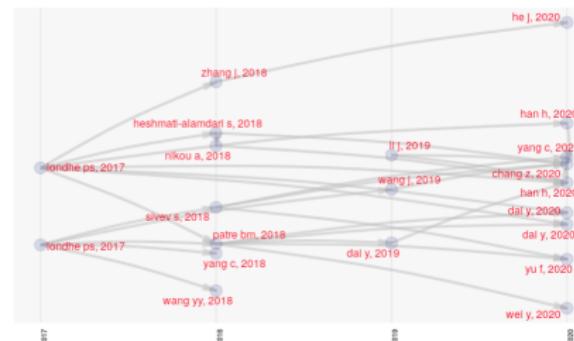
## 2º Ciclo - Bibliometrix

### Analisar o Historiograph

#### 1º Ciclo Historical Direct Citation Network



#### 2º Ciclo Historical Direct Citation Network



2º Ciclo - Bibliometrix

## Analisar o WorldCloud

1º Ciclo

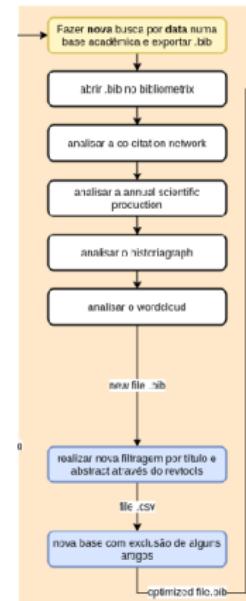


2º Ciclo



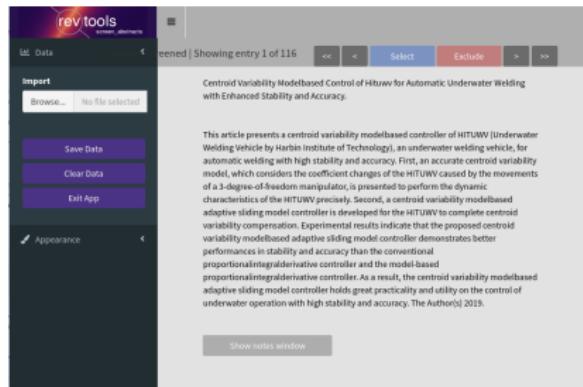
## 2º Ciclo

### Ciclo Otimizado



## 2º Ciclo - RevTools

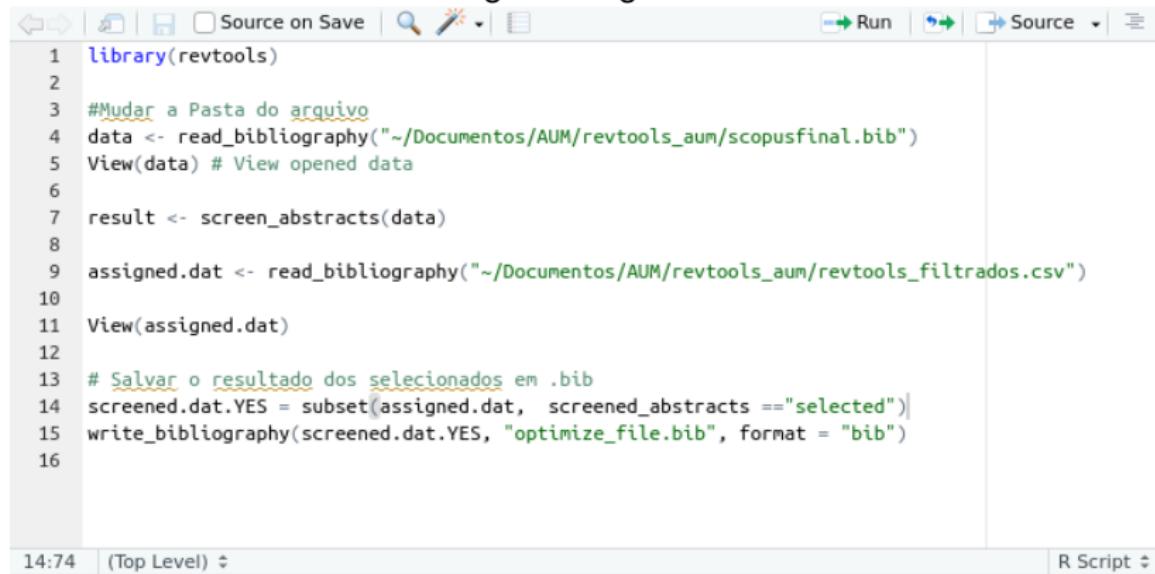
- É um pacote de R para apoiar pesquisadores que trabalham em projetos de síntese de evidências
- Visualizar padrões em dados bibliográficos
- Selecionar ou excluir interativamente artigos ou palavras individuais



## 2º Ciclo - RevTools

Realizar uma nova filtragem por título e resumo através do RevTools.

Nova base com exclusão de alguns artigos.



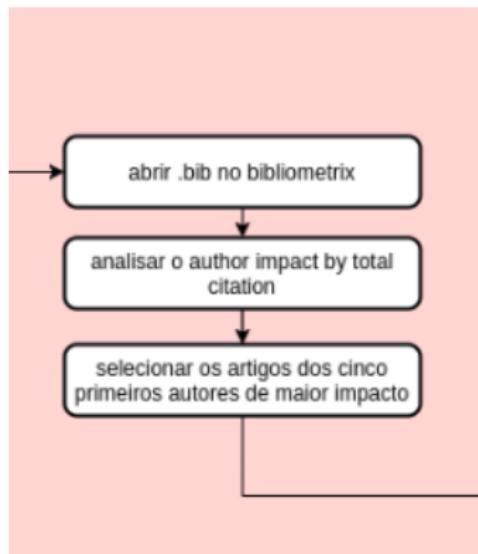
The screenshot shows an RStudio interface with an R script editor. The code is as follows:

```
library(revtools)
#Mudar a Pasta do arquivo
data <- read_bibliography("~/Documentos/AUM/revtools_aum/scopusfinal.bib")
View(data) # View opened data
result <- screen_abstracts(data)
assigned.dat <- read_bibliography("~/Documentos/AUM/revtools_aum/revtools_filtrados.csv")
View(assigned.dat)
# Salvar o resultado dos selecionados em .bib
screened.dat.YES = subset(assigned.dat, screened_abstracts == "selected")
write_bibliography(screened.dat.YES, "optimize_file.bib", format = "bib")
```

The status bar at the bottom left shows "14:74" and "(Top Level)". The status bar at the bottom right shows "R Script".

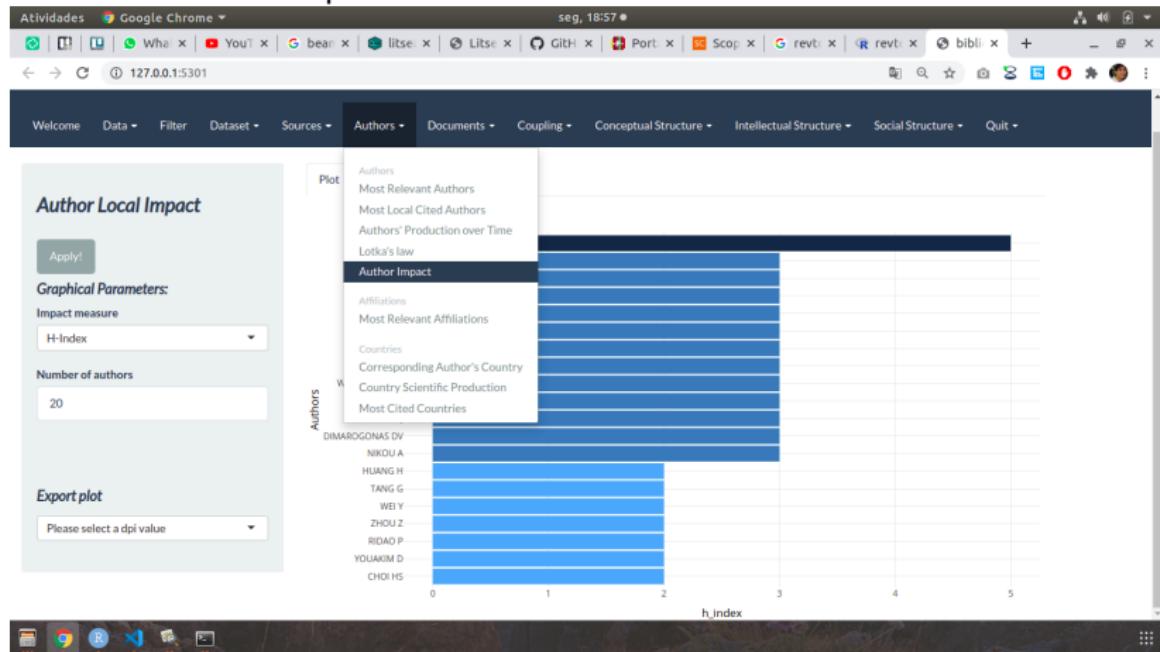
## 3º Ciclo

### Ciclo Impacto



## 3º Ciclo

### Analisar o Author Impact



## 3º Ciclo

### Analisar o Author Impact by Total Citation

Plot    Table

Show 20 rows    Copy    CSV    Excel    PDF    Print    Search:

Author	h_index	g_index	m_index	TC	NP	PY_start
WANG Y	5	9	0.833	99	9	2016
MOHANS	3	7	0.429	81	7	2015
LONDHE PS	3	5	0.429	80	5	2015
PATRE BM	3	5	0.429	80	5	2015
WAGHMARE LM	3	5	0.429	80	5	2015
DOUAT LR	1	1	0.167	60	1	2016
MANHES MMM	1	1	0.167	60	1	2016
RAUSCHENBACH T	1	1	0.167	60	1	2016
SCHERER SA	1	1	0.167	60	1	2016
VOSS M	1	1	0.167	60	1	2016
CHEN B	3	5	0.600	57	5	2017
WU H	3	5	0.600	57	5	2017
COLEMAN J	1	1	0.250	41	1	2018
DODY G	1	1	0.250	41	1	2018
OMERDI E	1	1	0.250	41	1	2018
SIVEV S	1	1	0.250	41	1	2018
TOAL D	1	1	0.250	41	1	2018
KIM J	1	3	0.143	40	3	2015
SANTHAKUMAR M	2	2	0.286	40	2	2015

## 3º Ciclo

Selecionar os artigos dos cinco primeiros autores de maior impacto

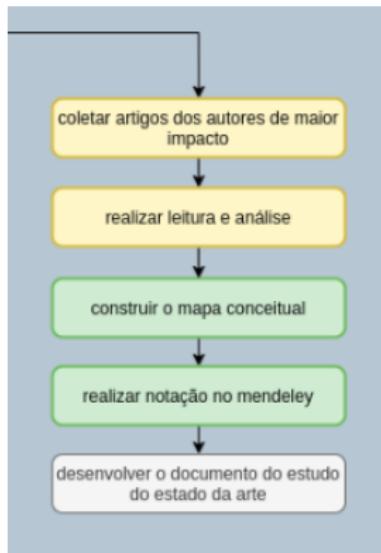
Welcome Data Filter Dataset Sources Authors Documents Coupling Conceptual Structure Intellectual Structure Social Structure Quit

Show 50 rows Print Search: MOHAN S

DOI	AU	DE	ID	C1	CR	J1	AB	AR	coden
<a href="#">10.1016/j.lockeng.2018.03.082</a>	PATRE BMLONDHE PS;WAGHMARE LMMOHAN S	AUTONOMOUS UNDERWATER VEHICLE (AUV); FINITE-TIME CONTROL; FUZZY LOGIC; LYAPUNOV STABILITY; TERMINAL SLIDING MODE CONTROL	COMPUTER CONTROLLERS; DYNAMICS; FUZZY LOGIC; MANIPULATORS; ROBUST CONTROL; SLIDING MODE CONTROL; TIME VARYING CONTROL SYSTEMS; UNEC	DEPARTMENT OF INSTRUMENTATION ENGINEERING, SHRI GURU GOBIND SINGHJI INSTITUTE OF ENGINEERING AND TECHNOLOGY, VISHNUPURI, NANDED, MAHARASHTRA, INDIA; D	ANTONELLI G., ON THE USE OF ADAPTIVE/INTEGRAL ACTIONS FOR SIX-Degrees-Of-Freedom Control of Autonomous Underwater Vehicles (2007) IEEE J. OCEAN. ENG.	OCEAN ENG.	IN THIS PAPER, A ROBUST FINITE TIME TRAJECTORY TRACKING CONTROL APPROACH IS PROPOSED TO CONTROL AUTONOMOUS UNDERWATER VEHICLE (AUV), WHICH BELONGS TO THE CLA	NA	NA
<a href="#">10.1109/OCEANSAP2016.7485382</a>	MOHAN SSINGHY	DYNAMIC POSITIONING; POSITION TRACKING CONTROL; REDUNDANCY RESOLUTION; TILTING; THRUSTER; THRUSTER; UNDERWATER VEHICLE	DEGREES OF FREEDOM (MECHANICS); DYNAMIC MODELS; MANIPULATORS; MECHANICS; NONLINEAR; POSITION CONTROL; REDUNDANCY; TRACKING (POSITION); VEHICL	MECHANICAL ENGINEERING, IT INDORE, INDORE, INDIA	ANTONELLI G. (2014) UNDERWATER ROBOTS: MOTION AND FORCE CONTROL OF VEHICLE-MANIPULATOR SYSTEMS, SPRINGER TRACTS IN ADVANCED ROBOTICS, BERLIN, JIN,	OCEANS-SHANGAI	UNDERWATER VEHICLES ARE USUALLY DESIGNED WITH ADDITIONAL DEGREES OF FREEDOM THAN THOSE REQUIRED TO ACCOMPLISH GIVEN MANIPULATOR TASKS; A ROBOT PLATFOR	7485382	NA

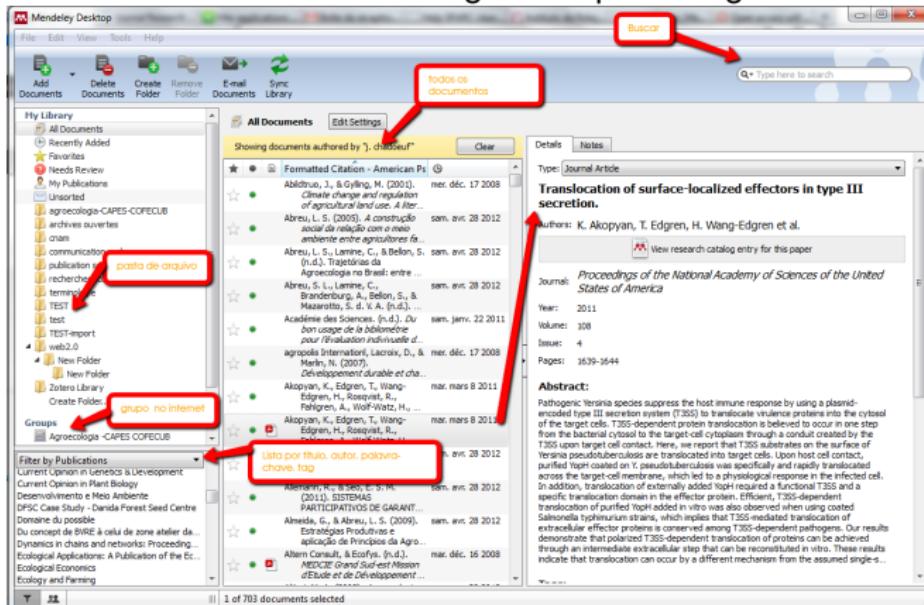
## 4º Ciclo

### Ciclo de Produção



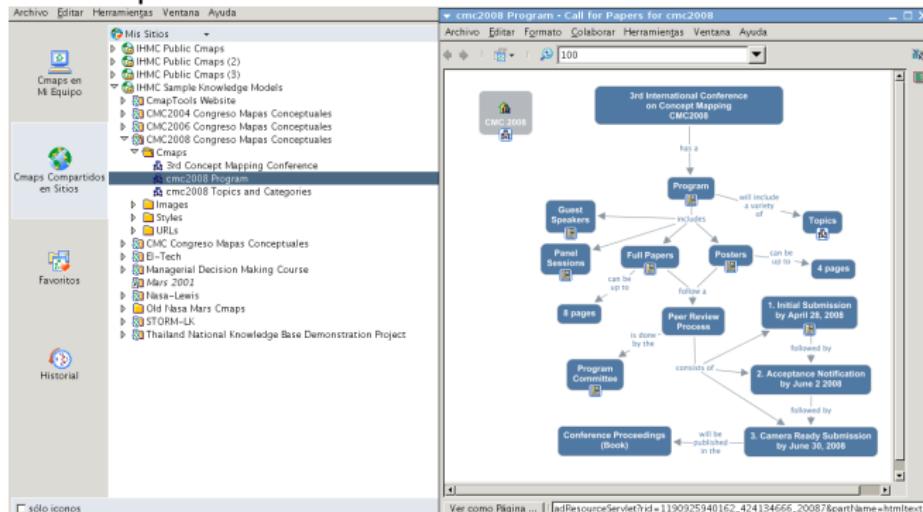
# Mendeley

Conhecido pelo gerenciador de referências, usado para gerenciar, compartilhar e criar referências bibliográficas para artigos acadêmicos.

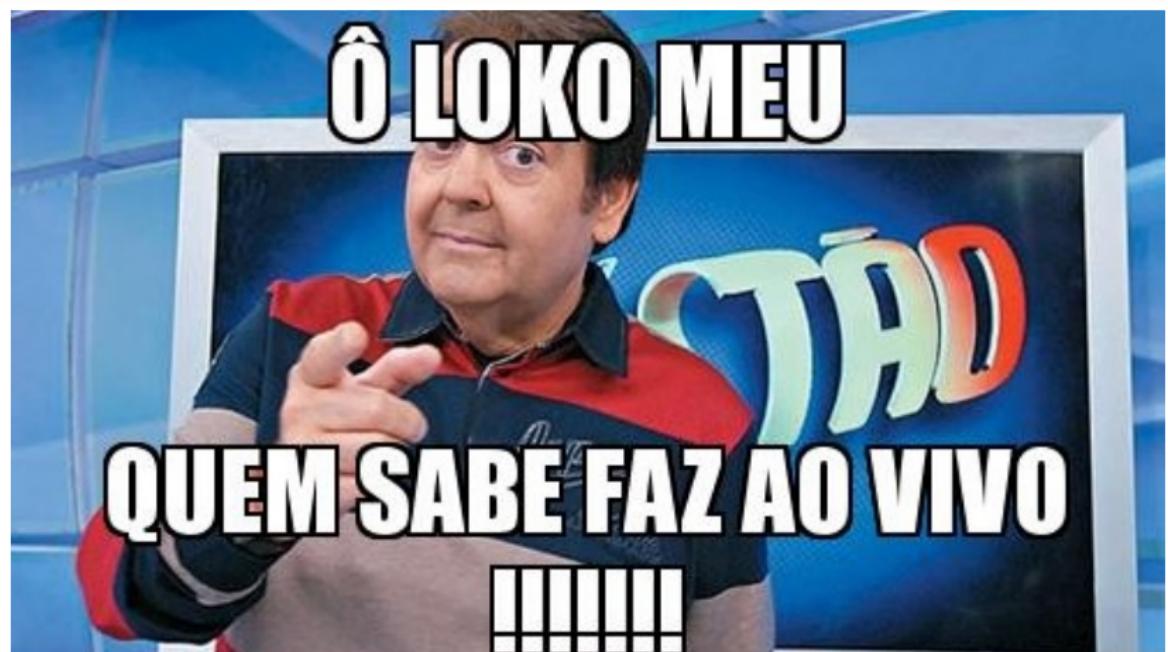


# CmapTools

## Software de mapeamento de conceito



Vamos à prática...



# Dúvidas?

anderson.vale@fbter.org

<https://github.com/Brazilian-Institute-of-Robotics/bir-mini-method-bili>

