

Quo vadis, free software? (Quo vadis, society?)



Three decades of Free Software and Social Medicine activism

GNU Health Con 2024

University of Palermo, Italy

Luis Falcón

About me



Luis Falcón

Founder, GNU Solidario

Author of GNU Health

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Mastodon:

[@meanmicio@todon.eu](https://mastodon.social/@meanmicio@todon.eu)

Academic & profession

- Physician
- Computer Scientist
- Genomics & Medical Genetics

Activism

- Social Medicine
- Animal Rights



About GNU Solidario



Non-for-profit organization

Works globally

Focused on Social Medicine

Fights for the right of human and nonhuman animals

The organization behind GNU Health

Promotes Libre Software and Open Science

Projects from GNU Solidario



GNU Solidario around the world



HQ HEADQUARTERS

HEALTH INSTITUTIONS

ACADEMIC INSTITUTIONS

REGIONAL OFFICES

ANIMAL RIGHTS

HUMANITARIAN MISSIONS

On Freedom

Some definitions of freedom:

- Liberty of the person from slavery, detention or **oppression**.
- Natural condition to act in any way, being responsible of your own acts
- Independent self-rule free from outside influence.

Concentration of power, oppression and abuse of people & nature

On capitalism



Every day 20,000 children die from Social Diseases



Human trafficking
Wars
Contaminated water
Malnutrition
Drugs
Chagas
Prostitution
Tuberculosis
Child Labor
Domestic violence
Malaria
HIV / AIDS
....

Europe

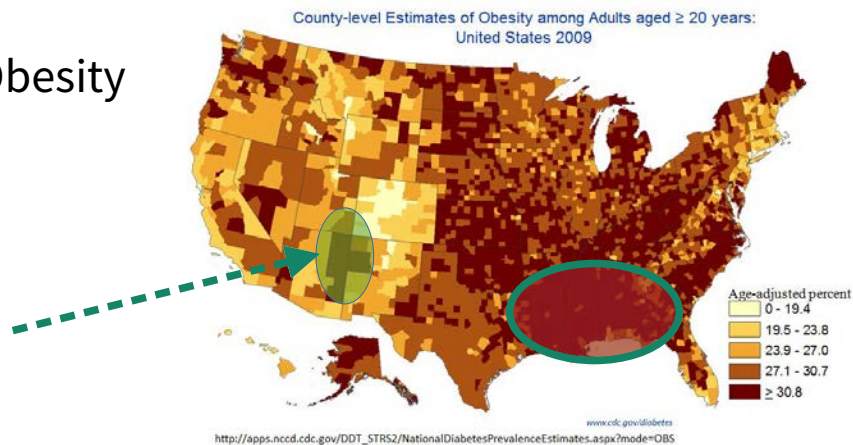


United States

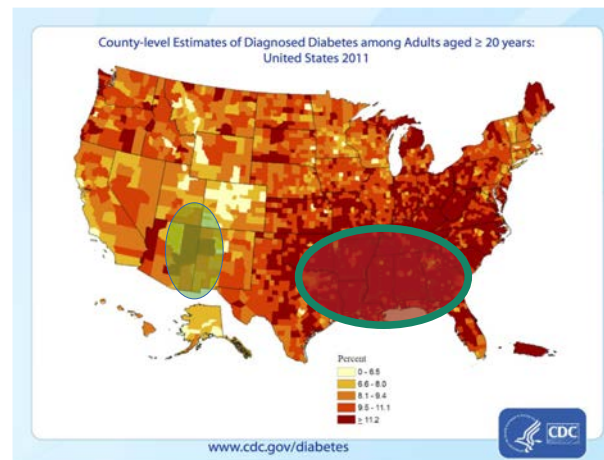


The victims of poverty in the United States

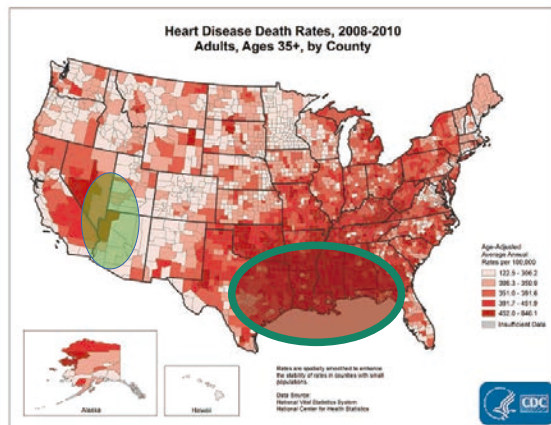
Obesity



Diabetes



Heart
disease



Social diseases



Tuberculosis: Paradigm of Social disease
1/3 of the global population is infected. Who gets sick?



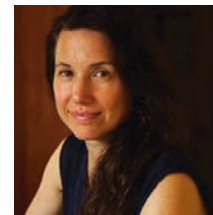
HUB

JOHNS HOPKINS
UNIVERSITY

New data shows COVID-19's disproportionate impact on American Indian, Alaska Native tribes

Johns Hopkins Coronavirus Resource Center, Center for American Indian Health launch visualization of pandemic spread within Tribal Nations

In-situ: Cancer as a result of social injustice



Dra. Natalia Luxardo
Univ Buenos Aires
CONICET

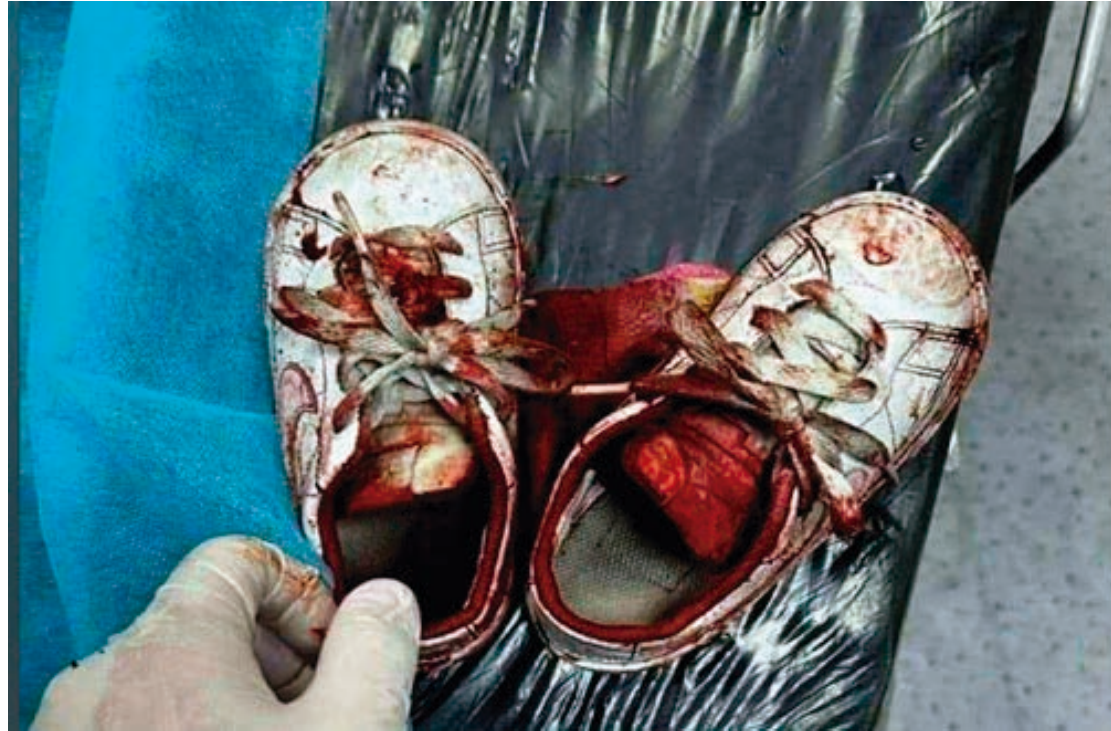


Dr. Fernando Sassetti
Univ Entre Ríos
Cátedra Salud Pública



GNU Health was used to collect and process the demographic, clinical, epidemiological and socio-sanitary information from the participating centers

Victims of Genocide and the macabre business of war

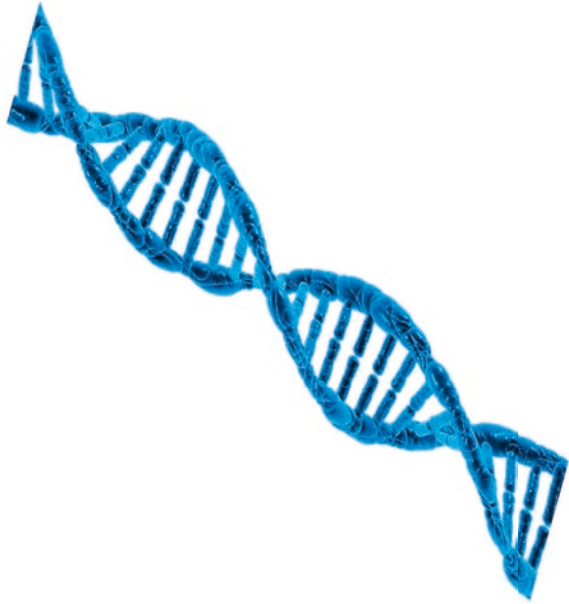


"My name was Haya"

Shoes from a 3-year old baby killed in a Israeli air strike to Al-Ahli hospital in Gaza
Src: Bushra Dabin / Mazen Eyon

Effects on the current Science and biomedical research

Patents on life



- BRCA1 & BRCA2 genes (involved in different types of malignancies, such as breast, ovarian and prostate cancer)
- Applied by Myriad Genetics & Univ. Of Utah on sequence and diagnostic methods (1994)
- Abusive monopoly with prices that only a few could afford the screening for some types of cancer
- Revoked by European Patent office in 2004

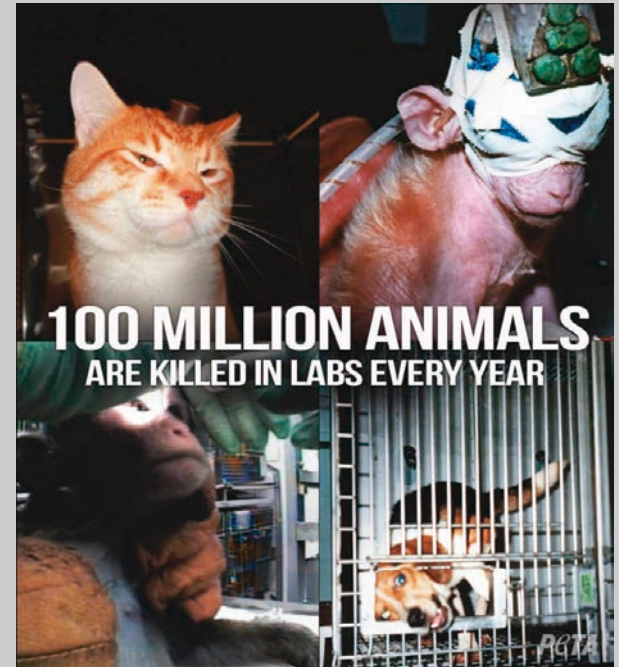
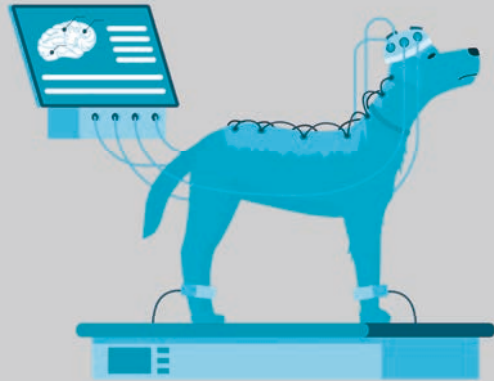
“This story shows us that the work done by the scientific community can be taken by a company”, Dominique Stoppa, Curie Institute

The Failure of Animal experimentation: A cruel business lost in translation



Argument solid
enough
to stop here

They kidnap, stress, torture, hurt and kill sentient beings.



Animal experimentation: A cruel, anachronic business lost in translation



Kidnapping, hurting and killing sentient beings is not science

- *“Humans are not 70-kg mice”* (Leist, Hartung)
- Over 96% trials result in failure
- $\approx 100\%$ failure in neurodegenerative conditions
- Lost in translation from preclinical animal trials to human.
- 3Rs (Replace, Reduce, Refine) is not enough

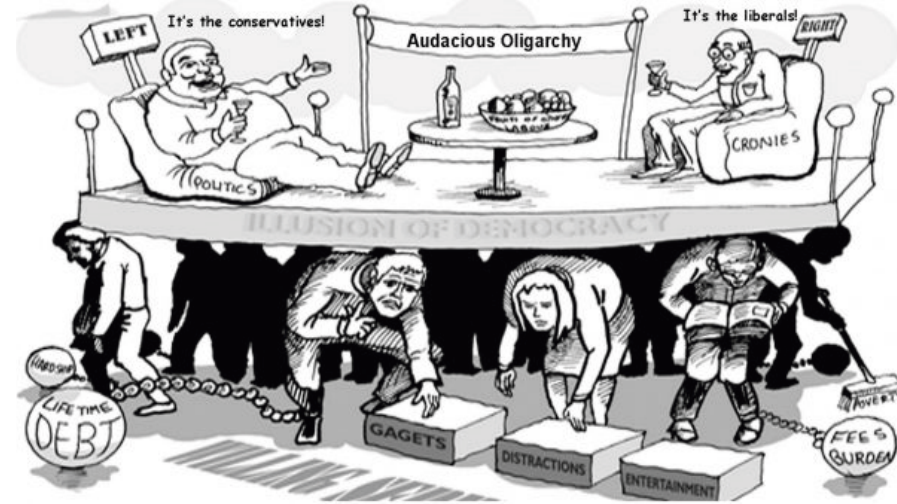
See : <https://www.gnusolidario.org/animalrights/petition-free-beagles.html>

~~Demos~~ kratos

The illusion of democracy

Demos Kratos: The illusion of democracy

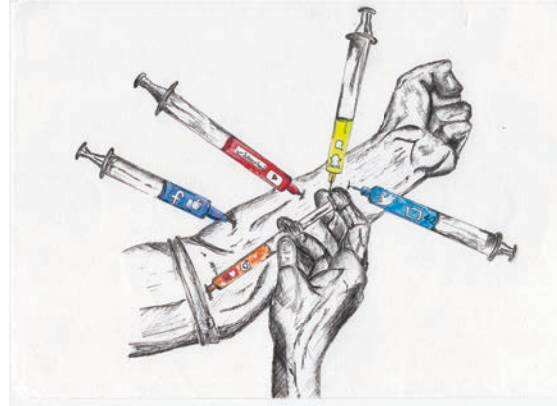
- A world governed by oligarchs and autocrats
- Corporatocracy
- Control of the media (and social media)
- Eradication of knowledge and critical thinking



Freedom: Independent self-rule free from outside influence.

Corporate antisocial networks – Just dump them

- Manipulative and toxic
- You are their product
- Pre-installed in most phones
- Negative impact on mental health and wellbeing
- Designed to be addictive:
 - Act on the reward pathway (dopamine)
 - Social pressure makes it hard to quit



Average teen spends 5 hour / day
on social media (source: APA)

Societies around the world are becoming equally numb, dull and flat



Anthropogenic Climate Emergency

Worst natural disaster in Spain (Valencia - 2024)



Animal agriculture and factory farming are the most polluting industries. They produce more greenhouse effect than transportation (UN). It is also source of pandemics, antibiotic resistance, oppression and extreme cruelty.

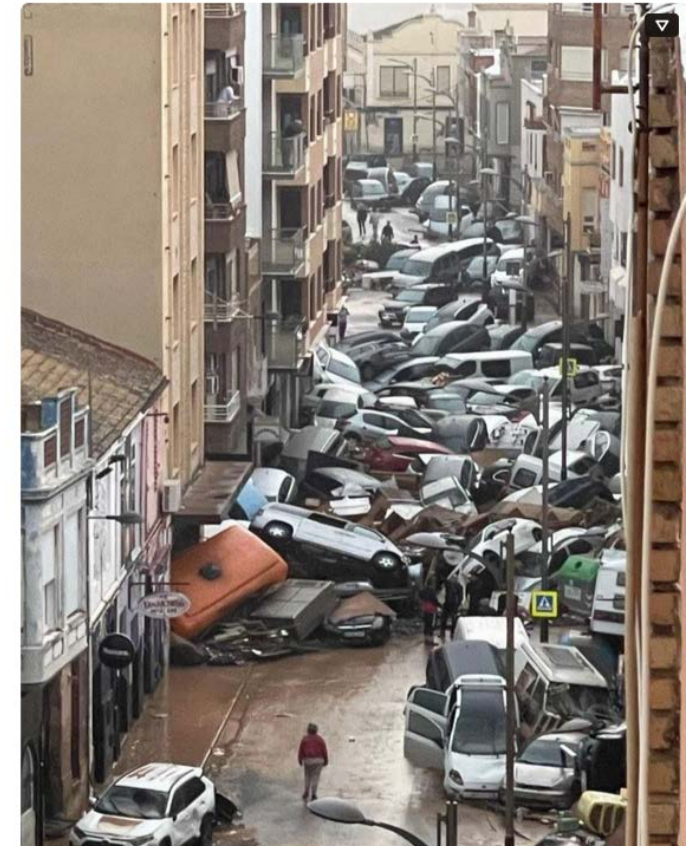


Street Art Utopia

@streetartutopia@mastodon.online

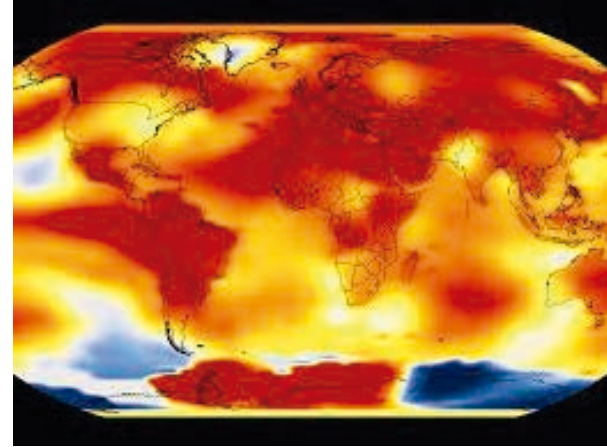
Oct 30

CLIMATE PROTESTORS NEED TO STOP BLOCKING ROADS!!



Luis Paton

Anthropogenic climate emergency, pandemics & social implications



The billionaires footprint on the environment



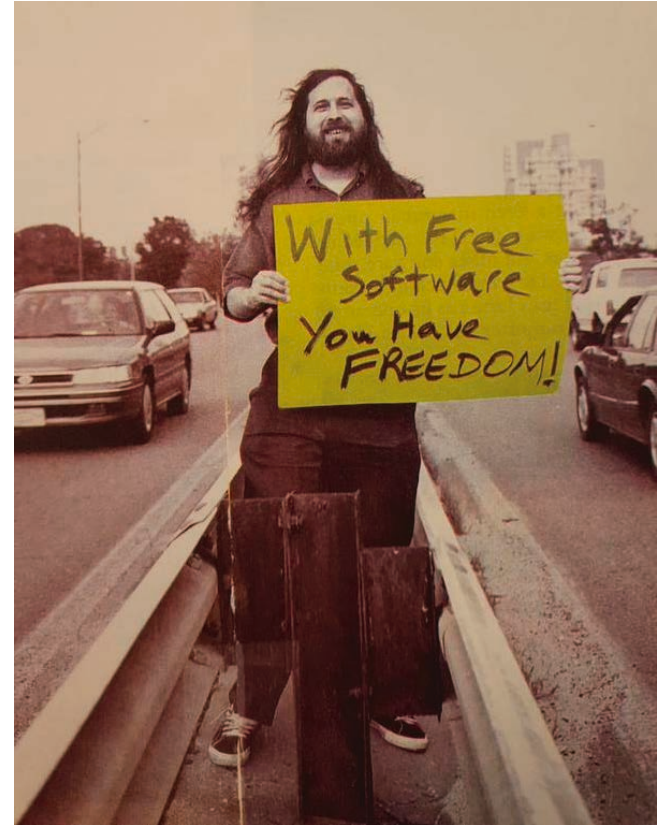
Billionaires generate more carbon pollution
in 90 minutes than you in your entire life

(Oxfam – 2024 – picture Futuro Vegetal)

The meaning of Free Software

On Free Software and “open source”

- Free/Libre software is a philosophy and movement (free culture & science)
- It's about collaboration, solidarity, equity and privacy
- Big tech companies have taken over part of the movement, making “open source” their business.
- The term “Free Software” respects RMS (father of the movement) will and the organizations behind the movement.



Free Societies are built with Free Software, not with “open source”





Your phone is their phone



Most mobile operating systems and “apps” are closed source

Many are spyware:

- social media
- health trackers
- Messenger applications

Cheer up!



Global**Exposome**
Compassionate Science, Sustainable Planet

Building modern, empathetic, free
societies, together.

Building modern, empathetic societies for a sustainable planet

Respect

Mother nature, animals
(human and non-human)

Education

People, patients, health prof,
Politicians...



GlobalExposome

Compassionate Science, Sustainable Planet

Research

Medicine, exposomics,
Agriculture,
Social sciences,
urbanism...

Collaboration

Open Science, Free Software,
Local capacity building

Respect: “First, do no harm”

Primum non nocere

Respect

Mother nature, animals
(human and non-human)



Education

Education



Santiago del Estero, Argentina 2006

Open Science and Open Access



In loving memory of Aaron Swartz, open science and free culture hero

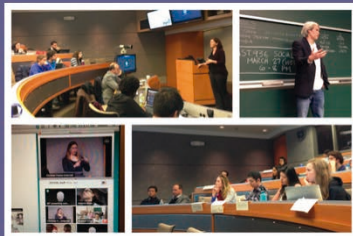
Working with academic and research institutions

Education

HST.936: Global Health Informatics to Improve Quality of Care

The 2015 iteration of our course will focus on Public Health Emergencies and Humanitarian Crises.

Classes begin: February 6, 2015
Fridays 9am – 11am ET (GMT -5)
Room: 09-057



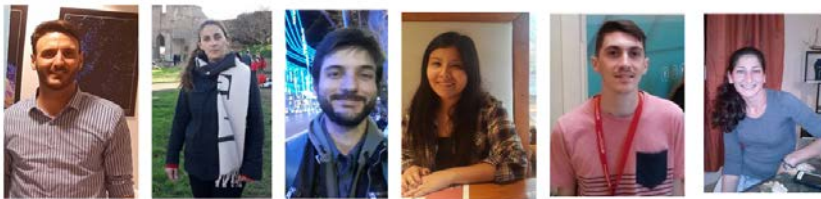
Leibniz
Universität
Hannover



Working with academic and research institutions

Education

1- Operative Team



2- Municipalities Team



3- Support staff



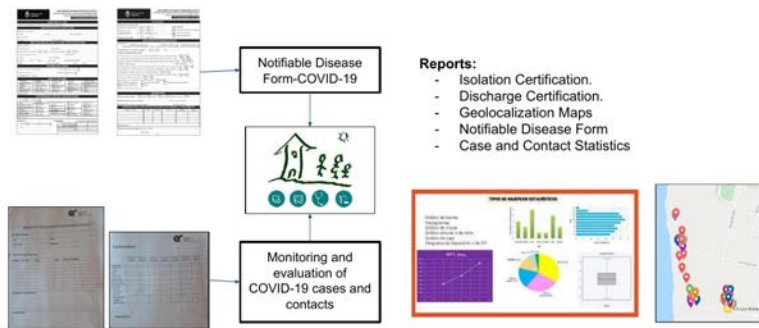
4 - Researchers



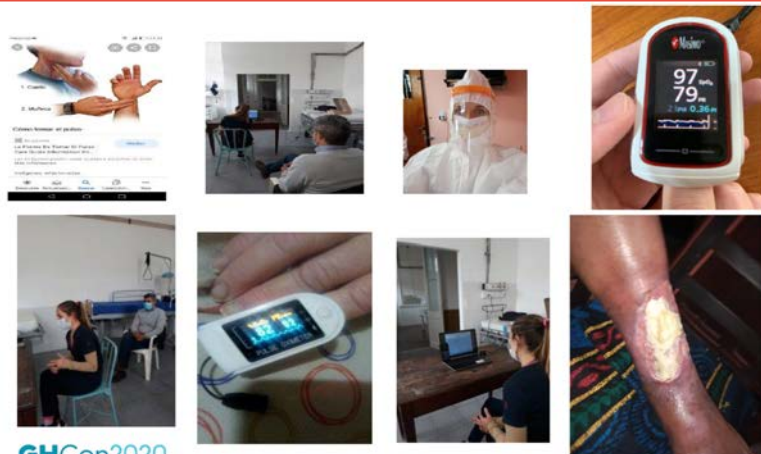
UNER - National University of Entre Ríos - Argentina

Education

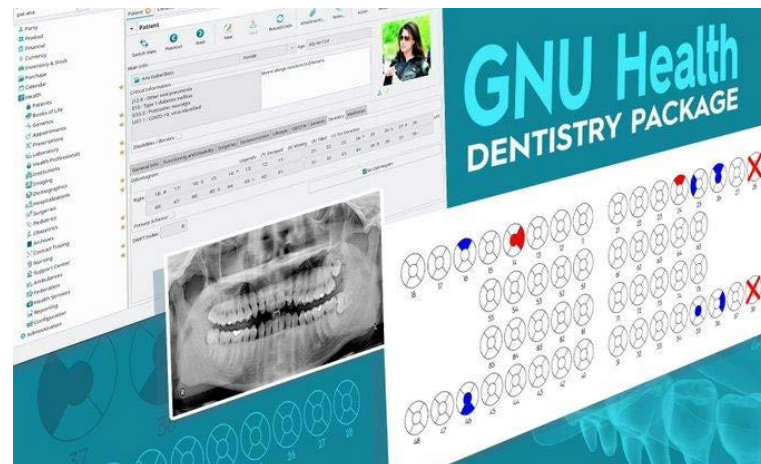
GNU Health COVID-19 Module



GHCon2020



GHCon2020



Educate our friends and policy makers on Public money, public code

Education



PUBLIC MONEY

PUBLIC CODE

Why is software created using taxpayers' money not released as Free Software?

We want legislation requiring that publicly financed software developed for the public sector be made publicly available under a [Free and Open Source Software](#) licence. If it is public money, it should be public code as well.

Code paid by the people should be available to the people!

<https://publiccode.eu/en/>

Show the benefits of Free/Libre Software to EU representatives

Education

Information gathered from participating institutions across the Union.
Realtime observatory,
Statistics, validation,...

Improve quality of care

From Medical imaging, laboratory and **genomics** to **Socioeconomic and lifestyle** information



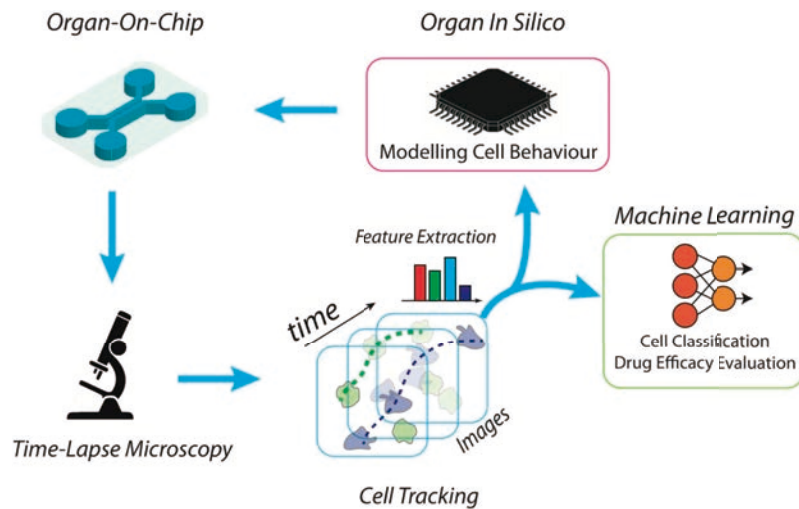
Open Science: Researchers, clinicians and other scientists in the EU and around the world will be able to participate

Using GPL license saves millions of euros and boosts collaboration for the betterment of our health systems.

We use ethical, human relevant alternatives to animal experimentation

Research

Support cruelty-free, human relevant research



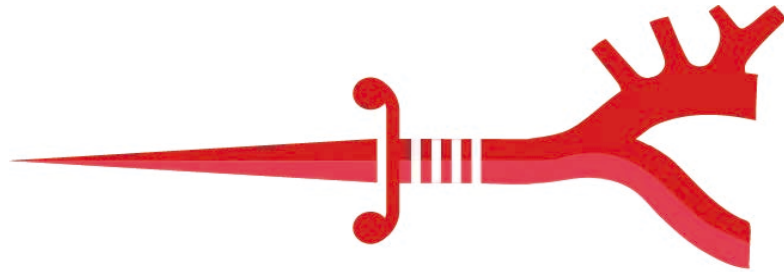
From Petri Dishes to Organ on Chip Platform: The Increasing Importance of Machine Learning and Image Analysis
<https://www.frontiersin.org/articles/10.3389/fphar.2019.00100/full>

NAMs

- New Approach Methodologies
- Human relevant
- Ethical
- Affordable
- Dynamic
- Specific to individual / context

Stiletto: Study of cerebral perforating arteries in health and disease

Research



STILETTO

A computational model of the cerebral perforating arteries in health and disease

- Role of exposome in Small Vessel Disease, cognitive impairment & dementia
- Multi-disciplinary project
- Tiny cerebral arteries (μm) critical in cerebral homeostasis
- Brain microcirculation and the neurovascular unit (NVU)
- Cruelty-free research (no animal models)
- Open Science for education and research



Privacy oriented, federated health networks

Research

The image displays the MyGNUHealth 2.0rc1 web application interface, which is designed for managing personal health records in a privacy-oriented, federated manner. The interface is divided into several sections:

- Variant Phenotypes:** A table listing various genetic variants and their associated phenotypes. The table has columns for 'Gene & Protein', 'Variant', and 'Phenotype'. The first column lists genes like BRCA1, BRIP1, and BAP1. The second column lists specific variants with their coordinates and amino acid changes. The third column lists the corresponding phenotypes, such as 'Breast cancer 1, early onset' or 'Fanconi anemia o'.
- 3D Molecular Model:** A visualization of a protein structure, likely related to the variants listed in the table.
- Variant Details:** A section showing detailed information about a specific variant, including its reference sequence ID (rs397508635), gene symbol (CFTR), and MIM identifier (P13569). It also displays the variant's location (p.Ser13Phe) and its association with Cystic fibrosis (CF) [MIM:219700].
- Domain & Context:** A section showing the variant's location within the CFTR protein structure, with a focus on the 'medical' and 'genetics' domains.
- Personal key:** A section for managing personal health records, including a 'Sign in' button.
- MyGNUHealth Logo:** The logo for MyGNUHealth, featuring a stylized figure sitting cross-legged, surrounded by icons representing health and genetics.

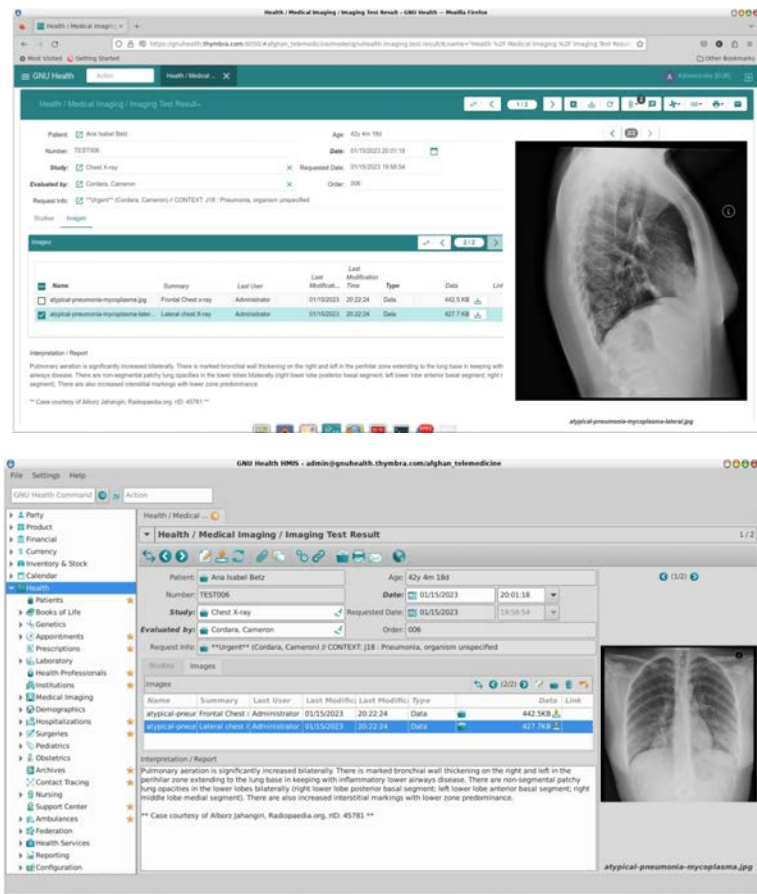
The interface is designed to be user-friendly and accessible, with a clear layout and intuitive navigation. It provides a comprehensive overview of a user's genetic data and its potential health implications.

Medical information from any device

Research



Access information from mobile (MyGNUHealth), desktop or web

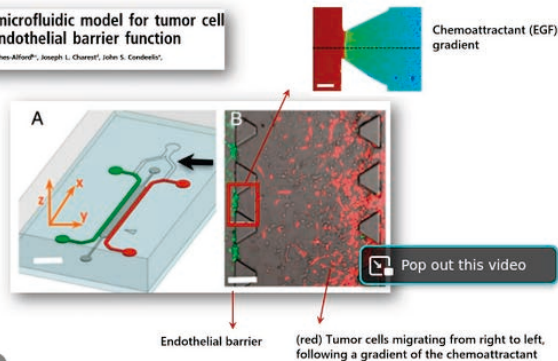


Cruelty-free, state-of-the-art, human relevant biomedical research



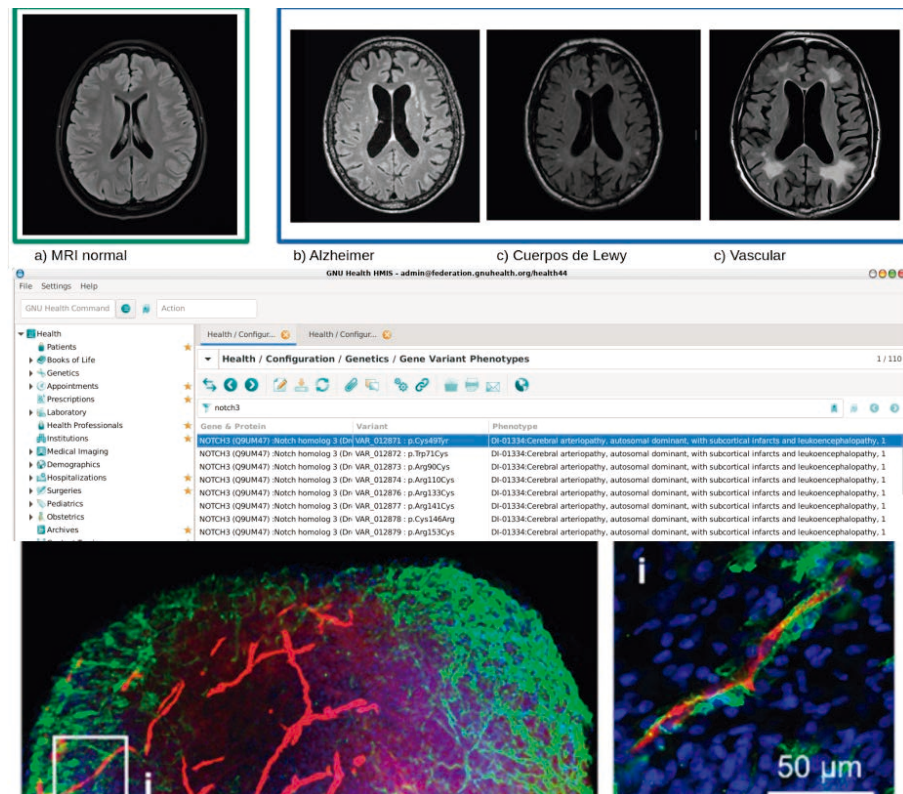
Three-dimensional microfluidic model for tumor cell intravasation and endothelial barrier function

Ioannis K. Zervantonakis¹, Shannon K. Hughes-Alford², Joseph L. Charest¹, John S. Condeelis¹, Frank B. Gerber¹, and Roger D. Kamm^{1,3}



[Link to paper](#)

Zervantonakis, I. K., Hughes-Alford, S. K., Charest, J. L., Condeelis, J. S., Gerber, F. B., & Kamm, R. D. (2012). Three-dimensional microfluidic model for tumor cell intravasation and endothelial

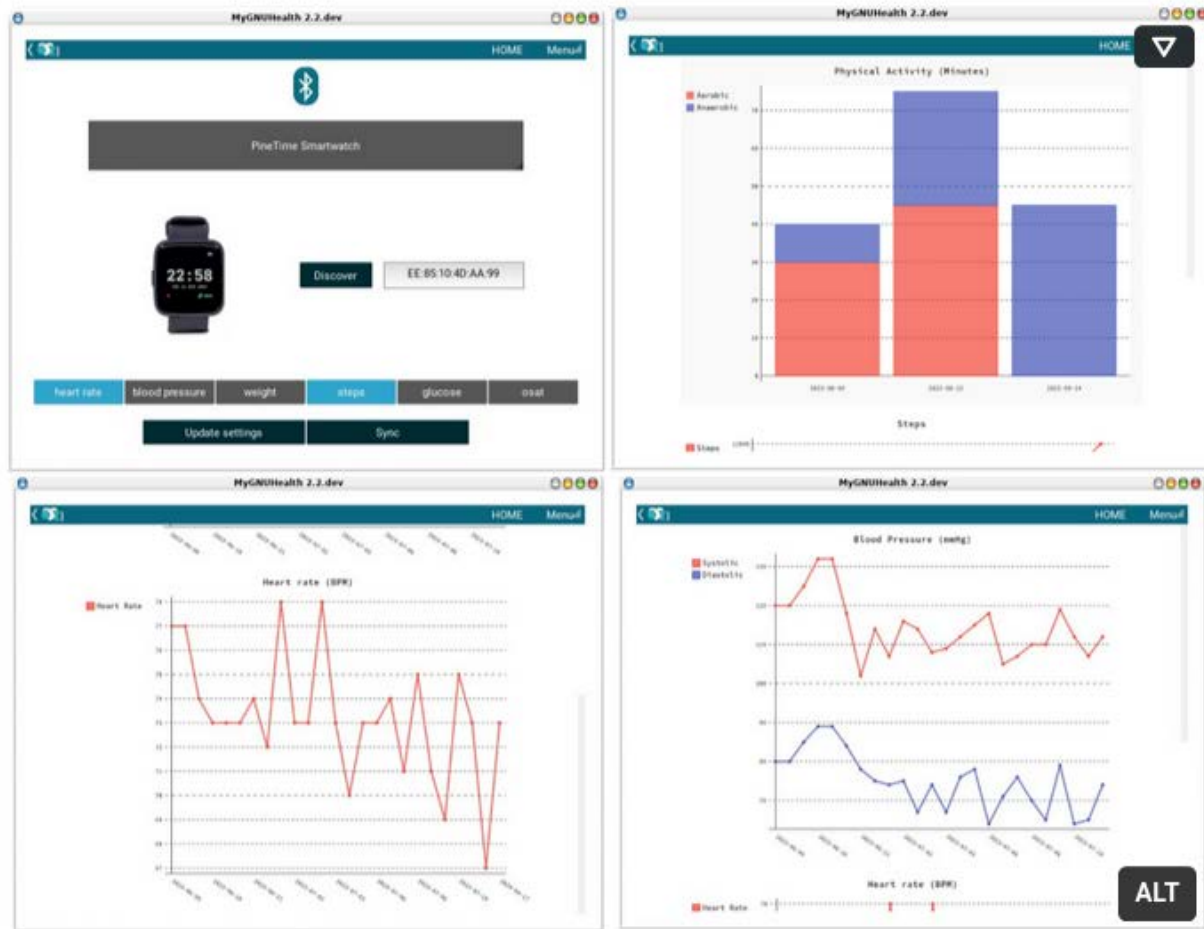


Open hardware

Collaboration



Integration of PineTime libre
Smartwatch with MyGNUHealth
Personal Health Record



Free/Libre - Privacy focused mobile phones

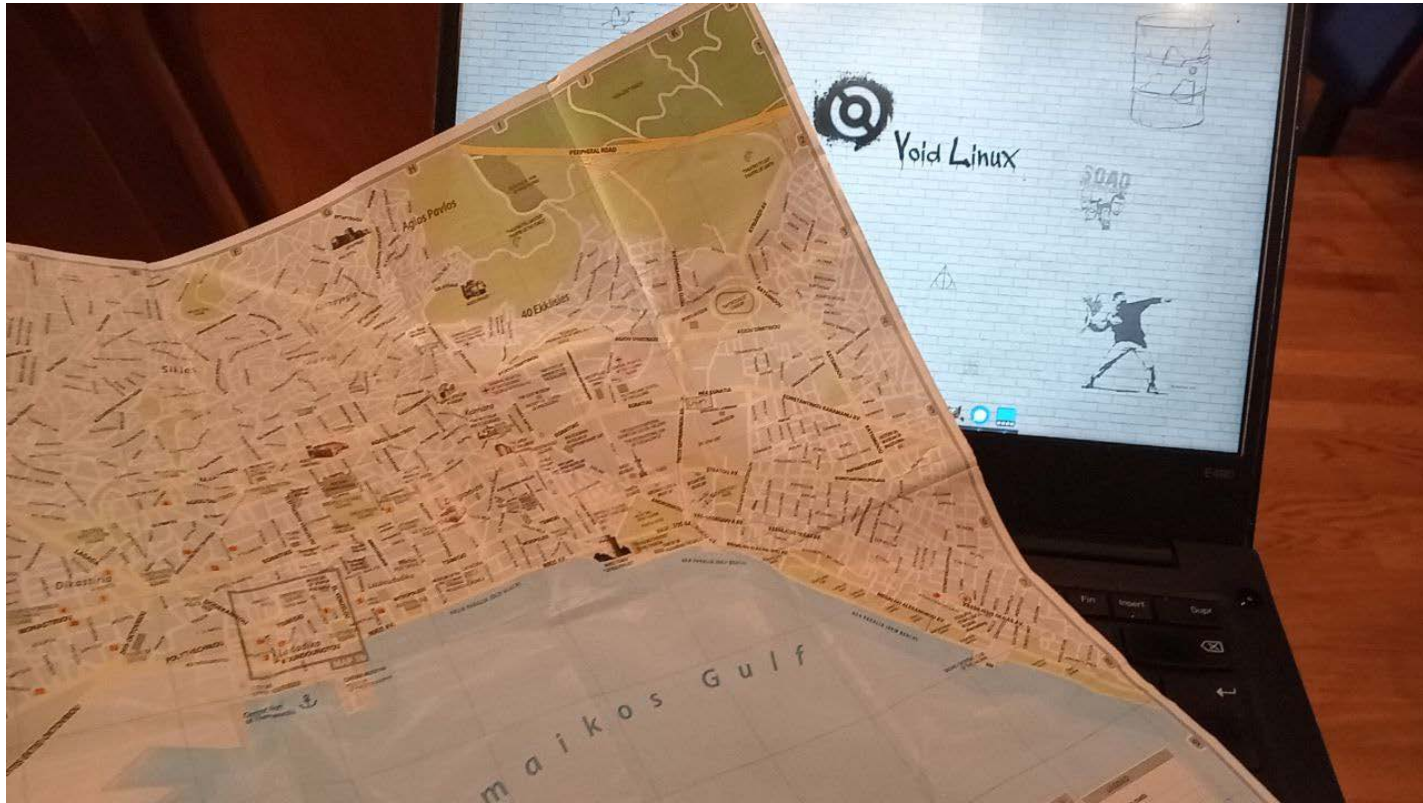


Pinephone and pinetime with MyGNUHealth



The privacy-oriented Vollaphone

Digression - Nothing beats a real map (and a friendly advise)



Getting around Thessaloniki with a real (paper) map

Use community based forges (Codeberg, GNU Savannah,...)

Collaboration



Codeberg and Savannah are two examples of community managed forges to host Free/Libre projects developments

Collaborating with Free Software community

Collaboration



The GNU Health Federation

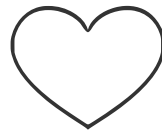


GNUHealth
FEDERATION

www.gnuhealth.org

Be proud!

Proud of our impact on Free Software & Social Medicine



GNU Health declared a Digital Public Good

Collaboration



Digital
Public
Goods
Alliance

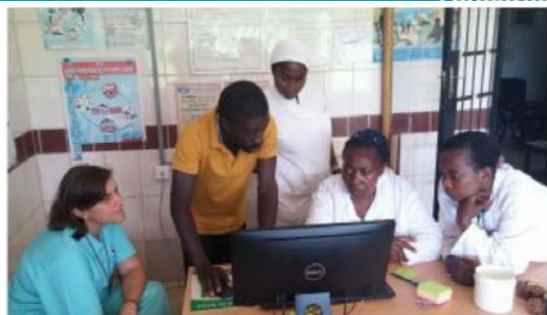


Adopted by Research institutions, Hospitals and labs around the globe

Collaboration



Fundación Jérôme Lejeune Argentina adopts GNU Health
research on Trisomy 21 and intellectual disabilities of genetic origin



GNU Solidario Haiti headquarter

Collaboration

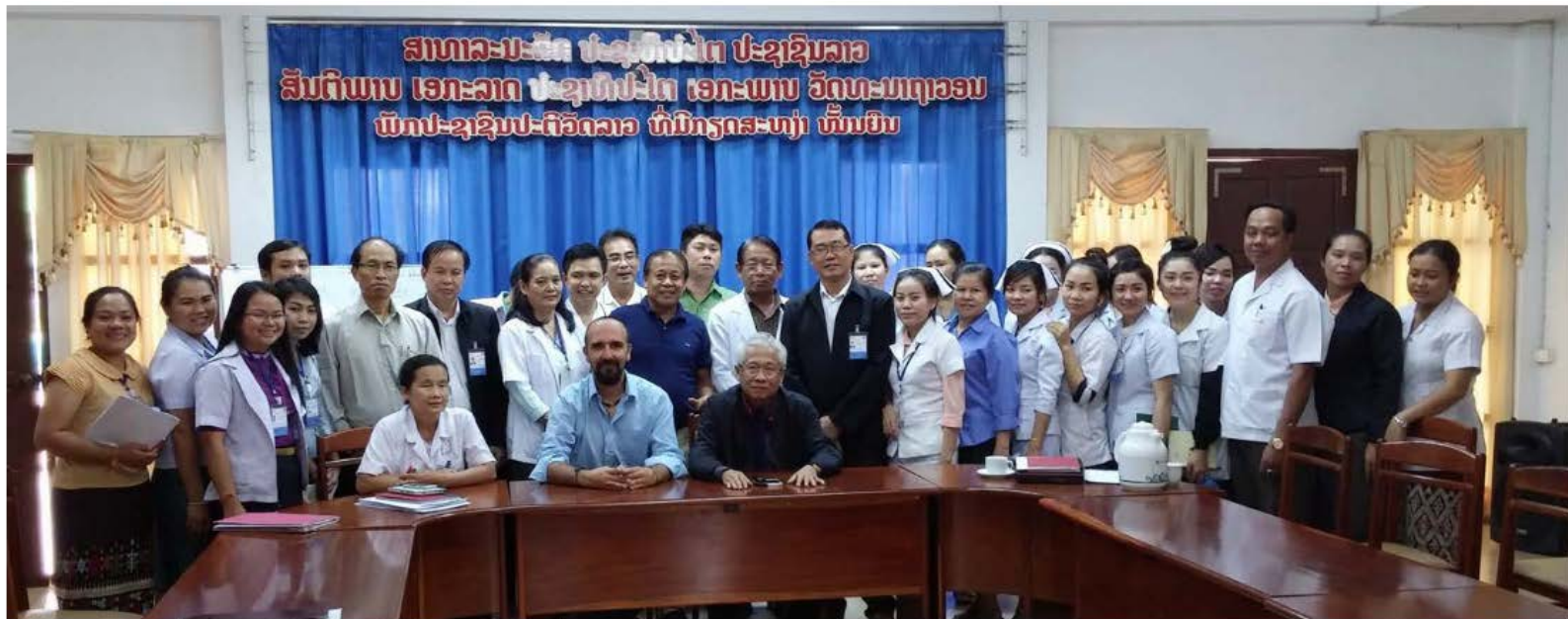


» Haiti Earthquake.-

Please help us providing relief to Haiti after the devastating earthquake that hit on Aug 14th, 2021. GNU Solidario is working in Limbé with our local colleagues to assess the damages and provide emergency support



Adopted by the Laos Ministry of Health

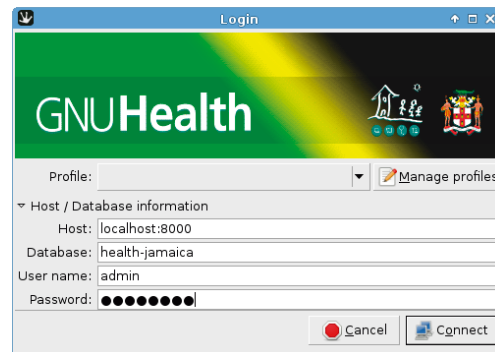


Jamaica Public Health System



“Memorandum of Understanding between the MOH and the lead entity of the GNU Health Community, GNU Solidario, which is a not-for-profit organization based in Spain. The use of FOSS provides a cost-effective national solution.”

Ministry of Health (2014)



And the largest public health institution in Asia - AIIMS



Genomics and Medical Genetics

Collaboration

Lejeune Foundation adopts GNU Health

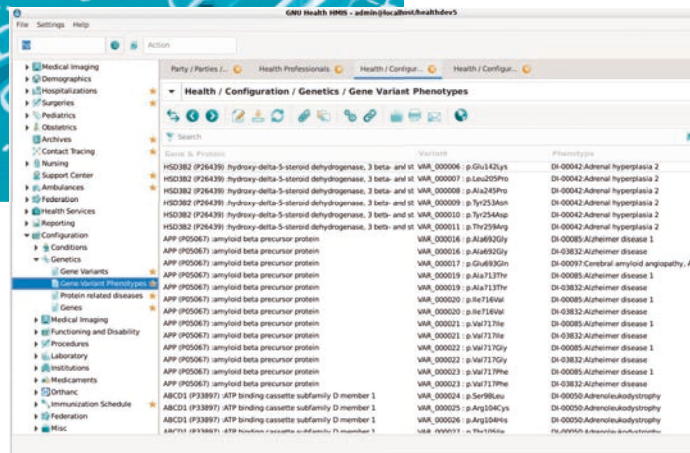
Leading the research on Trisomy 21 and intellectual disabilities of genetic origin



GNUHealth



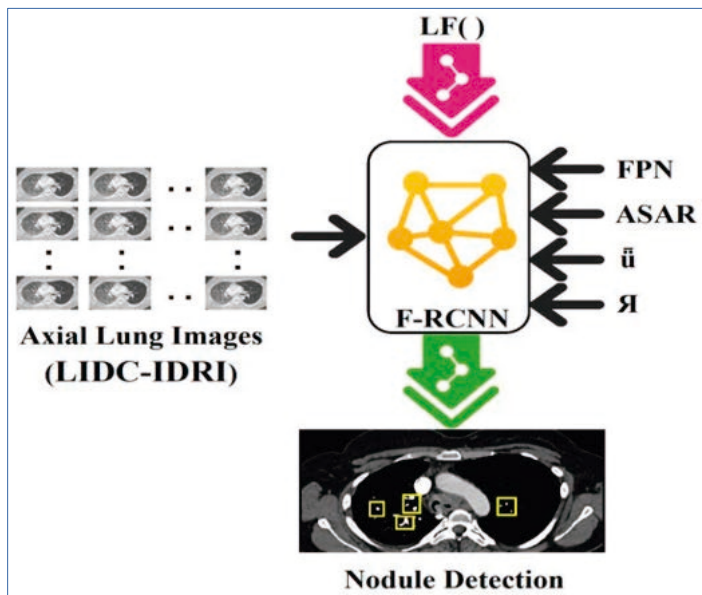
GNU Health is used by researchers on trisomy 21 as well as the diagnosis and management of other intellectual disabilities of genetic origin.



Thanks to our friends from [UniProt](#), we provide the extensive human gene natural variants dataset related phenotypes and genetic diseases research and clinical practice.

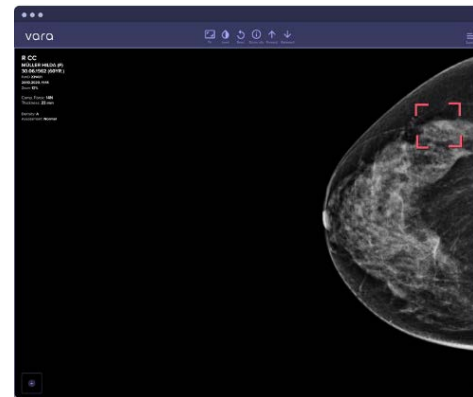
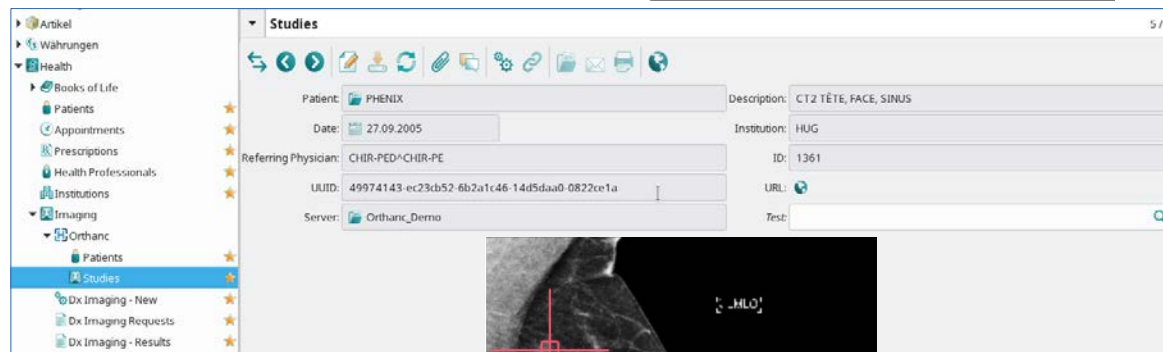
Medical Imaging & cancer prevention

Collaboration



GNU Health used in "Early Detection of Lung Nodules Using a Revolutionized Deep Learning Model"

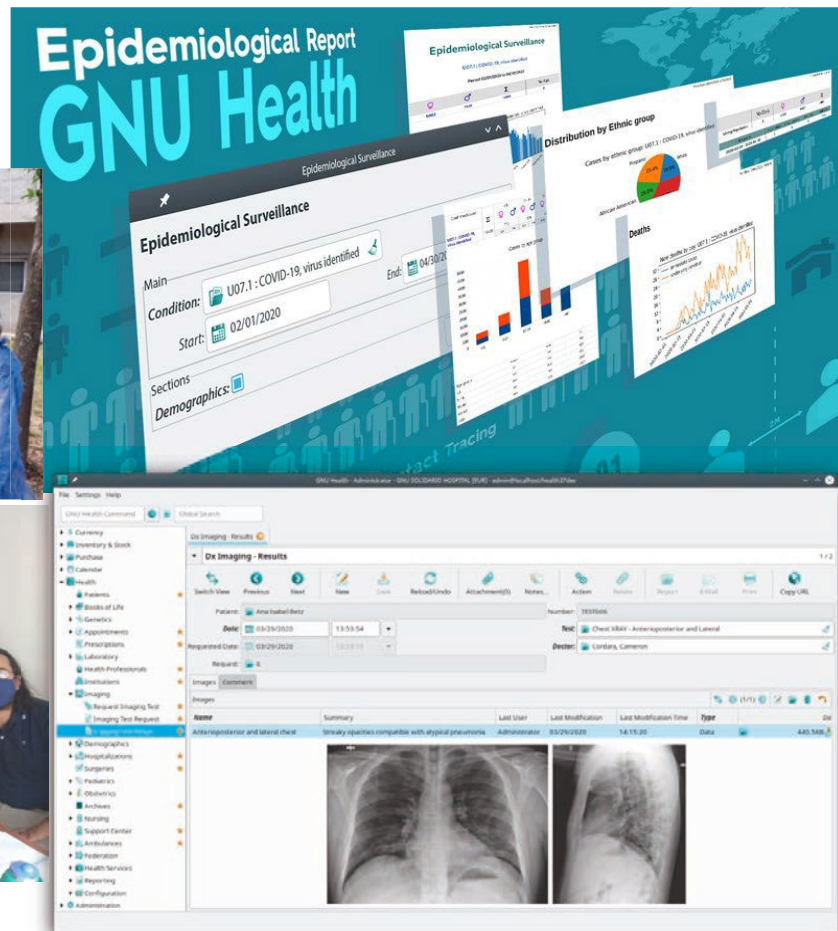
Some examples of use cases of GNU Health and Orthanc for the early detection of breast and lung cancer



ORT^HANC

GNU Health in COVID pandemic

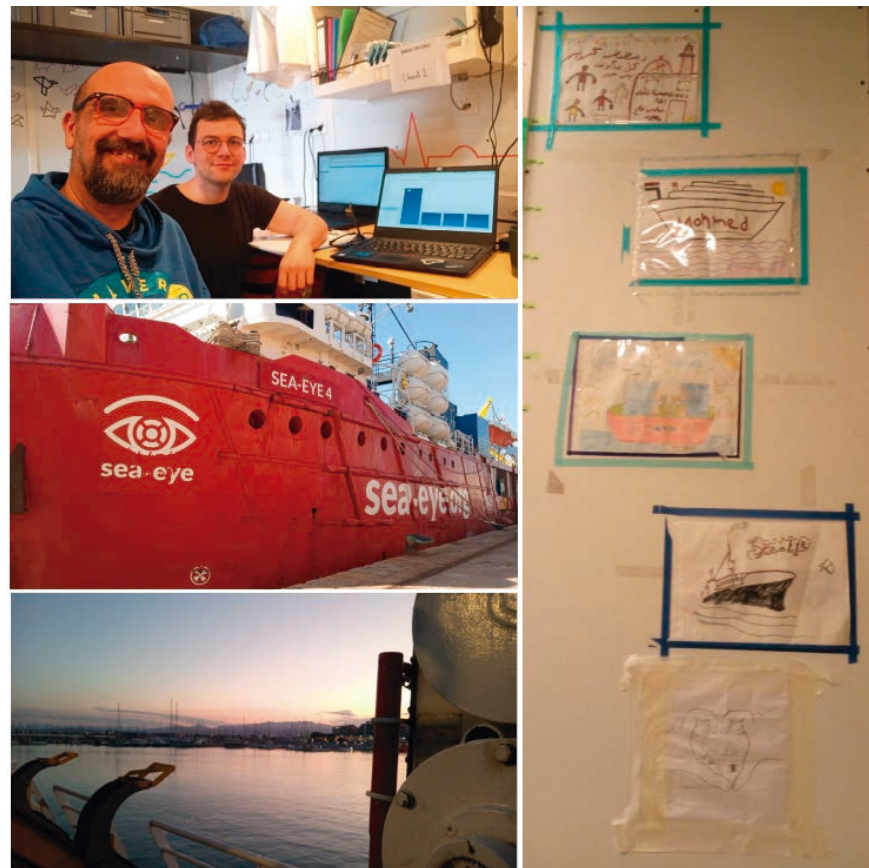
Collaboration



Helping the search and rescue missions in the Mediterranean

Collaboration

Advancing Social Medicine



Drawings made by rescued children during their stay on the boat

Teaming up with other medical and surgical NGOs in Africa

Collaboration



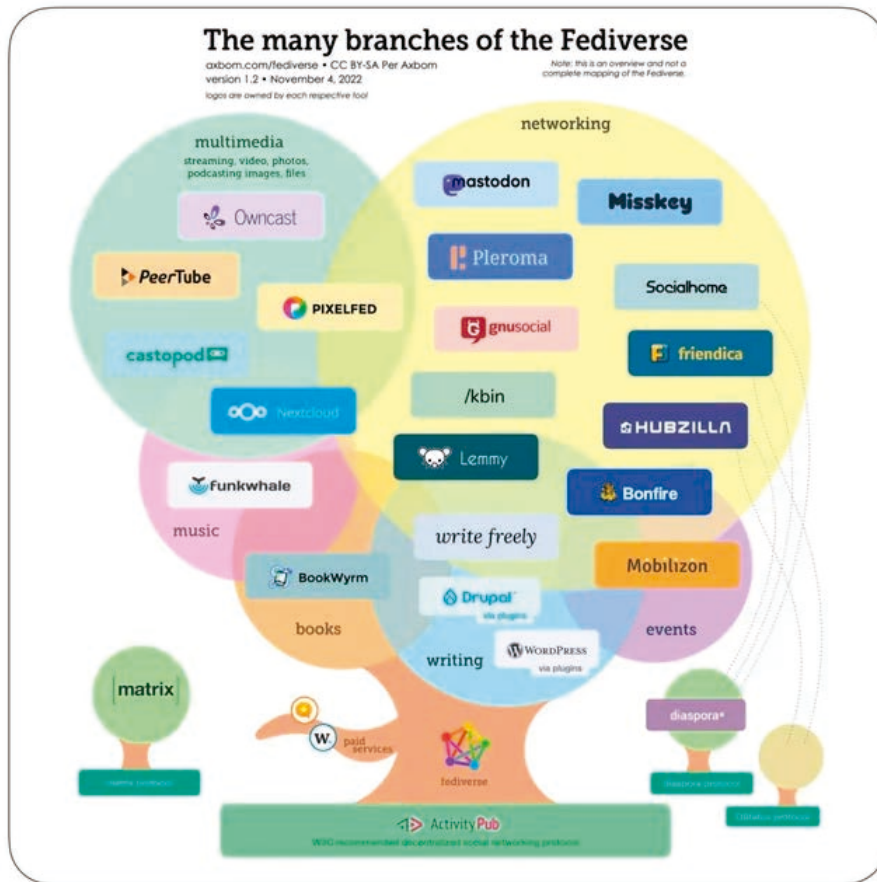
Mental Health and social inclusion of the underprivileged

Collaboration



Meet and Join us at the Fediverse

Collaboration



GNU Health

<https://mastodon.social/@gnuhealth>

GNU Solidario

<https://mastodon.social/@gnusolidario>

Let's keep Medicine a Social Science



“Medicine is a Social Science, and politics nothing but medicine at a larger scale”

Rudolf Virchow

Happy Hacking!

