



## La Federación GNU Health: Creando Redes de Salud e Investigación con Software Libre



GNUHealth  
FEDERATION

[www.gnuhealth.org](http://www.gnuhealth.org)

Congreso esLibre  
Vigo, 24 y 25 de Junio



Edición presencial y virtual

Luis Falcón





## Luis Falcón

Presidente, GNU Solidario

Autor de GNU Health

falcon@gnuhealth.org

## Educación & Profesión

- Científico de la computación
- Médico
- Genómica y Genética Médica

## Activismo

- Medicina Social
- Derechos de los Animales





- **GNU Solidario**

- La ONG detrás de GNU Health
- Organización sin fines de lucro
- Con ámbito geográfico global
- Focalizada en Medicina Social

- **Proyecto oficial de GNU**

- GNU Health es un proyecto oficial de GNU
- Está alojado en Savannah
- Réplicas alrededor del mundo
- Comunidad internacional de usuarios





# GNUHealth

The Free / Libre Hospital and Health Information System



## Social Medicine & Health Informatics



# GNU Health en el Mundo



GNU Health Goes to Jamaica !



Adopted by  
**UNITED NATIONS UNIVERSITY**



# Naciones Unidas



# Organización Mundial de la Salud - OMS



Calendario de vacunaciones



Entrenamiento a representantes de la OMS de Africa occidental

Malaria, TB and HIV modules  
Lista de Medicamentos esenciales  
Enfermedades tropicales  
ICD-10 ICPM  
Tablas de crecimiento  
pediátricos



Implementación de GNU Health en el hospital de Bafia, Cameroon con la Organización Mundial de la Salud

# GNU Health declarado Digital Public Good



Digital  
Public  
Goods  
Alliance



# Academia



United Nations University, Kuala Lumpur, Malasia



Univ. Palermo, Italia



Universidad de Entre Rios, Argentina

## 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 8am - 11am ET (GMT -5)  
Room: 09-057



Harvard / MIT, Boston, United States





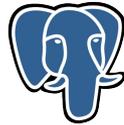
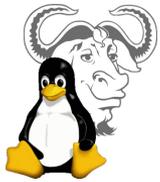
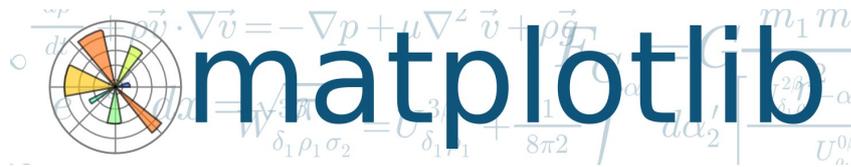
# Proyecto oficial de GNU

Proyecto oficial de GNU

Documentación abierta

Basado en tecnología Libre

Comunidad internacional



PostgreSQL



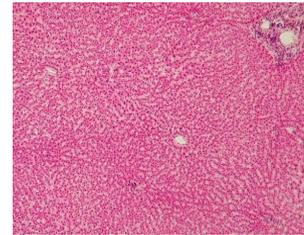
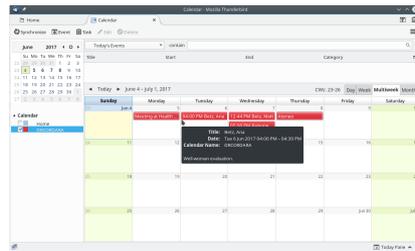
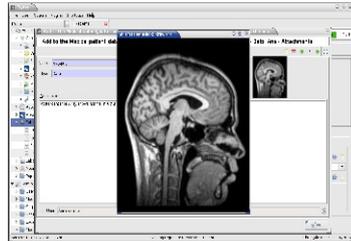
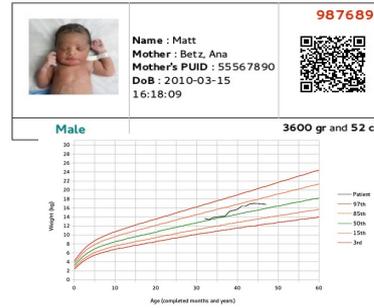
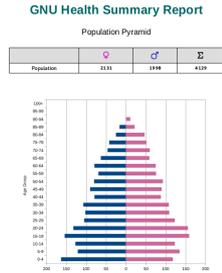
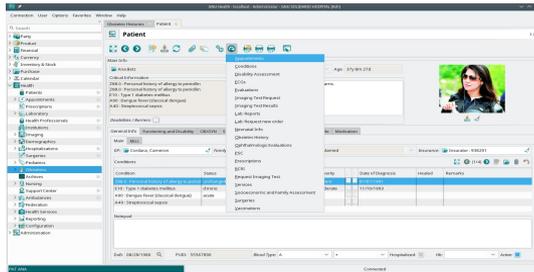
La Federación GNU Health:  
Creando redes de Salud e Investigación con Software Libre



# Componentes del ecosistema GNU Health



# GNU Health HMIS



MoH / Analytics

Hospital Management ERP

Electronic Health Record

Demographics / Social Medicine

# GNU Health en Dx por imágenes

- ▶ Artikel
- ▶ Währungen
- ▶ Health
  - ▶ Books of Life
  - ▶ Patients
  - ▶ Appointments
  - ▶ Prescriptions
  - ▶ Health Professionals
  - ▶ Institutions
  - ▶ Imaging
    - ▶ Orthanc
      - ▶ Patients
      - ▶ Studies
      - ▶ Dx Imaging - New
      - ▶ Dx Imaging Requests
      - ▶ Dx Imaging - Results

**Studies**

Patient: PHENIX Description: CT2 TÊTE, FACE, SINUS  
 Date: 27.09.2005 Institution: HUG  
 Referring Physician: CHIR-PED^CHIR-PE ID: 1361  
 UUID: 49974143-ec23cb52-6b2a1c46-14d5daa0-0822ce1a URL:   
 Server: Orthanc\_Demo Test:



Orthanc Demo - Patient - Study - Series

Lookups Plugins

Patient	Series
<b>BRANIX</b> PatientID: Tuesday, March 1, 1949 PatientID: 5196 PatientSex: M	<b>TJSDFFFC</b> Study: IRM cérébrale, neuro-crâne AcquisitionNumber: 8 InstitutionName: TCG FRFCapex44100_Buq055X ReferringPhysicianName: BRANIX^J2JME RequesterProcedureDescription: IRM cérébrale, neuro-crâne StudyDate: Friday, December 1, 2006 StudyID: 218213405 StudyInstanceID: 3.18.87098.11.0.0.11.4.2.0.8743.5396.2006120114483521694

Orthanc Demo - Patient - Study - Series

Lookups Plugins

Instance
<b>Instance 1</b> SOPInstanceUID: 3.18.87098.11.0.0.11.4.2.0.8743.5396.2006120114483570701 TemporalPositionIdentifier: 1
<b>Instance 2</b> SOPInstanceUID: 3.18.87098.11.0.0.11.4.2.0.8743.5396.2006120114483564700 TemporalPositionIdentifier: 1
<b>Instance 3</b> SOPInstanceUID: 3.18.87098.11.0.0.11.4.2.0.8743.5396.2006120114483557099 TemporalPositionIdentifier: 1
<b>Instance 4</b> SOPInstanceUID: 3.18.87098.11.0.0.11.4.2.0.8743.5396.2006120114483550698 TemporalPositionIdentifier: 1
<b>Instance 5</b> SOPInstanceUID: 3.18.87098.11.0.0.11.4.2.0.8743.5396.2006120114483543697 TemporalPositionIdentifier: 1
<b>Instance 6</b> SOPInstanceUID: 3.18.87098.11.0.0.11.4.2.0.8743.5396.2006120114483520596 TemporalPositionIdentifier: 1
<b>Instance 7</b> SOPInstanceUID: 3.18.87098.11.0.0.11.4.2.0.8743.5396.2006120114483529695 TemporalPositionIdentifier: 1
<b>Instance 8</b> SOPInstanceUID: 3.18.87098.11.0.0.11.4.2.0.8743.5396.2006120114483521694 TemporalPositionIdentifier: 1



# GNU Health embedded

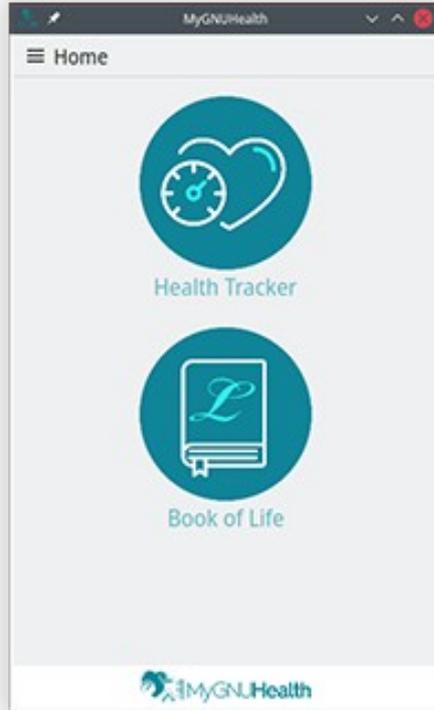


El proyecto GNU Health embedded nos permite incorporar GNU Health en dispositivos de una sólo placa. Desde gestión de Unidades Domiciliarias, centros de salud, Laboratorios o centros de investigación

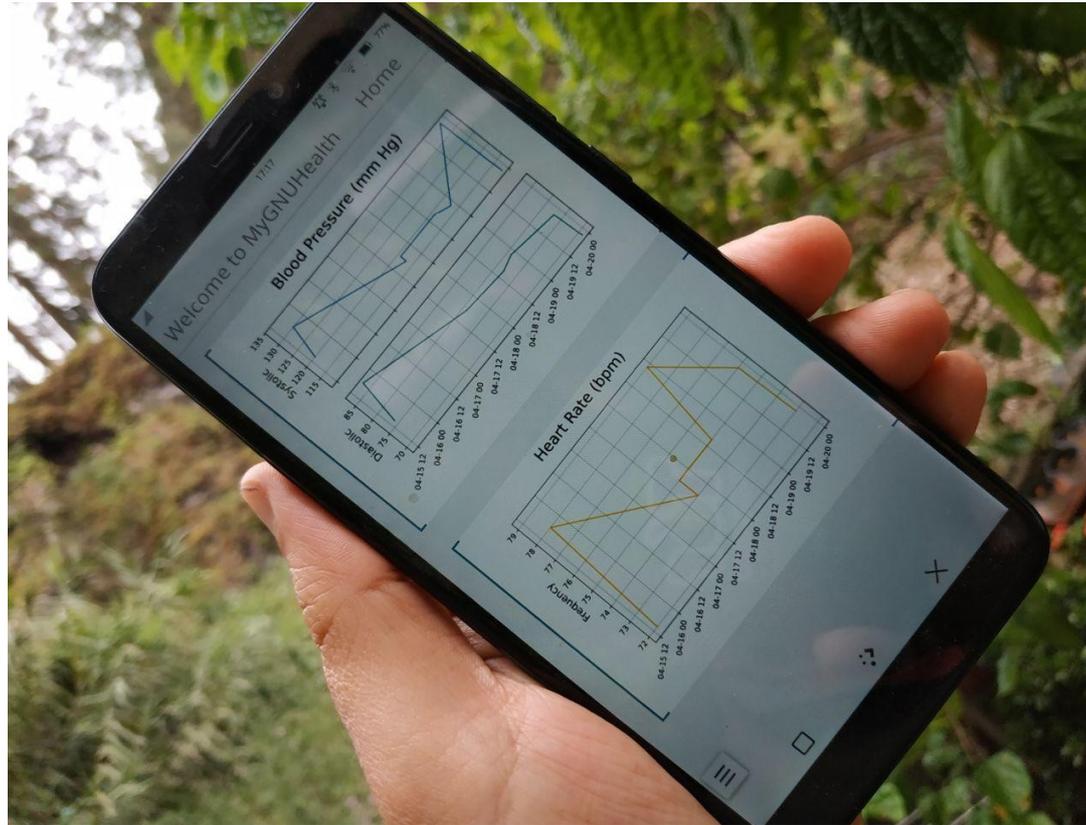
# MyGNUHealth: The Libre Personal Health Record



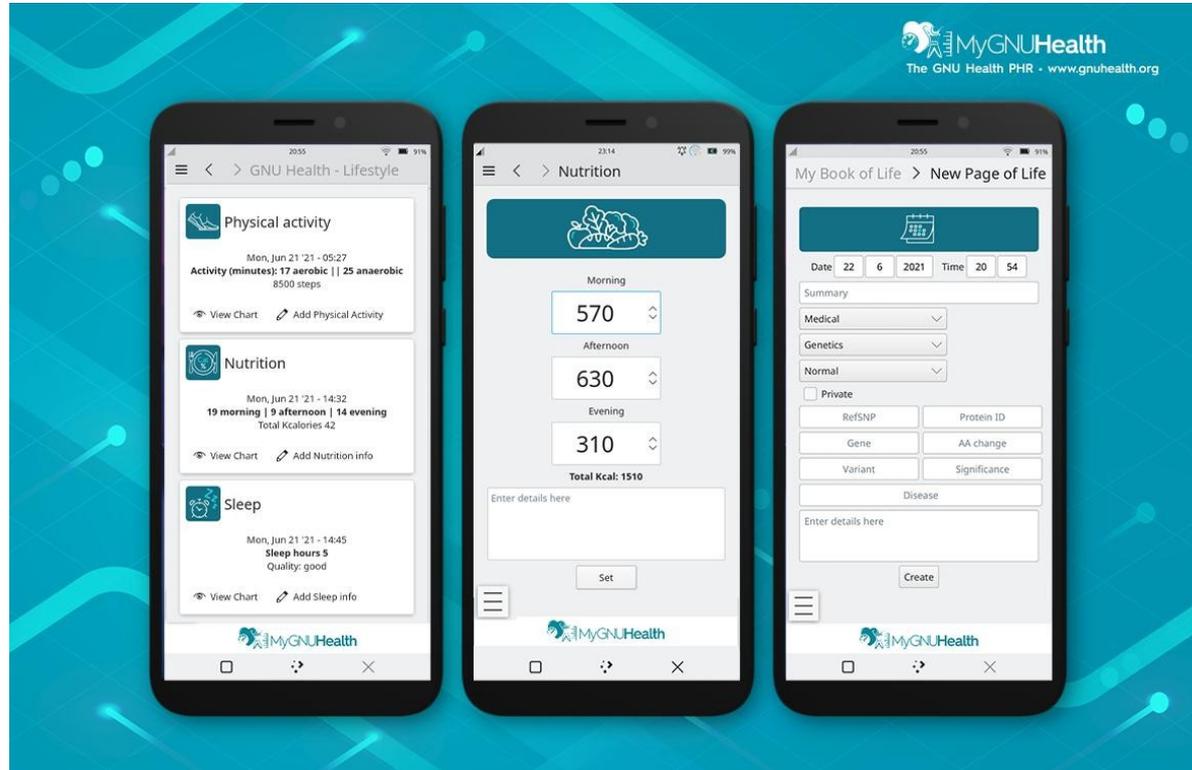
# MyGNUHealth en desktops / laptops



# MyGNUHealth en Linux Phones y VollaOS (dev)



# MyGNUHealth





# Integrando y agregando recursos (técnicos y humanos) en GNU Health Federation



# GNU Health Federation



Nodos

Servidor de Mensajes

Sistema de Información

# MyGNUHealth en la Federación GH



Cada persona es un nodo

Actualización en tiempo real con su profesional y sistema de salud

Control sobre qué comparte

Disminuye la carga en el sistema de salud pública

Convierte y empodera al ciudadano en un actor principal del sistema de salud

# Observatorio epidemiológico en tiempo real



# GH Federation en la Investigación de enf. neurodegenerativas y cáncer

The screenshot shows a web application window titled 'GNU Health - admin@localhost/genetics - Administrator - GNU SOLIDARIO HTAL [Euro]'. The main content area is titled 'Variant Phenotypes' and displays a table of genetic variants. The table has three columns: 'Gene & Protein', 'Variant', and 'Phenotype'. The variant 'VAR\_020683 : p.Asp749Iyr' is highlighted in blue. To the right of the table is a 3D molecular model visualization showing a complex protein structure with various atoms represented by colored spheres (white, grey, red, blue, yellow, green, purple, orange, brown).

Gene & Protein	Variant	Phenotype
BRCA1 (P38398) :breast cancer 1, early onset	VAR_007778 : p.Thr1025Ile	DI-02602:Breast cancer
BRCA1 (P38398) :breast cancer 1, early onset	VAR_007781 : p.Val1047Ala	DI-02602:Breast cancer
BRCA1 (P38398) :breast cancer 1, early onset	VAR_007782 : p.Pro1150Ser	DI-02602:Breast cancer
BRCA1 (P38398) :breast cancer 1, early onset	VAR_007796 : p.Ala1708Glu	DI-02602:Breast cancer
BRCA1 (P38398) :breast cancer 1, early onset	VAR_007799 : p.Met1775Arg	DI-02602:Breast cancer
BRCA1 (P38398) :breast cancer 1, early onset	VAR_020679 : p.Glu10Lys	DI-02602:Breast cancer
BRCA1 (P38398) :breast cancer 1, early onset	VAR_020680 : p.Glu23Lys	DI-02602:Breast cancer
BRCA1 (P38398) :breast cancer 1, early onset	VAR_020683 : p.Asp749Iyr	DI-02602:Breast cancer
BRCA1 (P38398) :breast cancer 1, early onset	VAR_020690 : p.Ser1187Ile	DI-02602:Breast cancer
BRCA1 (P38398) :breast cancer 1, early onset	VAR_020691 : p.Gln1200His	DI-02602:Breast cancer
BRCA1 (P38398) :breast cancer 1, early onset	VAR_020692 : p.Arg1204Ile	DI-02602:Breast cancer
BRCA1 (P38398) :breast cancer 1, early onset	VAR_020693 : p.Lys1207Asn	DI-02602:Breast cancer
BRCA1 (P38398) :breast cancer 1, early onset	VAR_020695 : p.Ser1217Tyr	DI-02602:Breast cancer
BRCA1 (P38398) :breast cancer 1, early onset	VAR_063212 : p.Met1775Lys	DI-02602:Breast cancer
BRCA1 (P38398) :breast cancer 1, early onset	VAR_075666 : p.Arg1699Trp	DI-02602:Breast cancer
BRIP1 (Q98X63) :BRCA1 interacting protein C-terminus	VAR_020896 : p.Pro47Ala	DI-02602:Breast cancer
BRIP1 (Q98X63) :BRCA1 interacting protein C-terminus	VAR_020900 : p.Met299Ile	DI-02602:Breast cancer
BRCA1 (P38398) :breast cancer 1, early onset	VAR_007757 : p.Cys61Gly	DI-01655:Ovarian cancer
BRCA1 (P38398) :breast cancer 1, early onset	VAR_020702 : p.Cys1697Arg	DI-01655:Ovarian cancer
BRCA1 (P38398) :breast cancer 1, early onset	VAR_075666 : p.Arg1699Trp	DI-01655:Ovarian cancer
BRCA1 (P38398) :breast cancer 1, early onset	VAR_020679 : p.Glu10Lys	DI-01559:Breast-ovarian cancer, familial, 1
BRCA1 (P38398) :breast cancer 1, early onset	VAR_020680 : p.Glu23Lys	DI-01559:Breast-ovarian cancer, familial, 1
BRCA1 (P38398) :breast cancer 1, early onset	VAR_020690 : p.Ser1187Ile	DI-01559:Breast-ovarian cancer, familial, 1
BRCA1 (P38398) :breast cancer 1, early onset	VAR_020691 : p.Gln1200His	DI-01559:Breast-ovarian cancer, familial, 1
BRCA1 (P38398) :breast cancer 1, early onset	VAR_020695 : p.Ser1217Tyr	DI-01559:Breast-ovarian cancer, familial, 1
BRCA1 (P38398) :breast cancer 1, early onset	VAR_020696 : p.Phe1226Leu	DI-01559:Breast-ovarian cancer, familial, 1
BRCA1 (P38398) :breast cancer 1, early onset	VAR_020697 : p.Arg1243Gly	DI-01559:Breast-ovarian cancer, familial, 1
BRIP1 (Q98X63) :BRCA1 interacting protein C-terminus	VAR_023700 : p.Gln255His	DI-01603:Fanconi anemia complementation group
BRIP1 (Q98X63) :BRCA1 interacting protein C-terminus	VAR_023702 : p.Ala349Pro	DI-01603:Fanconi anemia complementation group
BRIP1 (Q98X63) :BRCA1 interacting protein C-terminus	VAR_023703 : p.Trp647Cys	DI-01603:Fanconi anemia complementation group
BRIP1 (Q98X63) :BRCA1 interacting protein C-terminus	VAR_023704 : p.Arg707Cys	DI-01603:Fanconi anemia complementation group

At the bottom of the application window, it says 'Connected'.

Below the table is a 3D molecular model visualization showing a complex protein structure with various atoms represented by colored spheres (white, grey, red, blue, yellow, green, purple, orange, brown). The model is displayed in a window titled 'VMD 1.9.4a12 OpenGL Display'. At the bottom of the VMD window, there is a console output showing statistics:

```

Info) Angles: 0 Dihedrals: 0 Improper: 0 Cross-terms: 0
Info) Bondtypes: 0 Angletypes: 0 Dihedraltypes: 0 Improper types: 0
Info) Residues: 224
Info) Waters: 3
Info) Segments: 1
Info) Fragments: 5 Protein: 2 Nucleic: 0
  
```

# Propuesta GNU Health a nuestros gobiernos

## ID único

Para usar en todo el sistema nacional de salud, e incluso a nivel global

## Modelo Federado

Actualización demográfica y médica en tiempo real, disponible en todos los centros del país

## Empoderar la comunidad

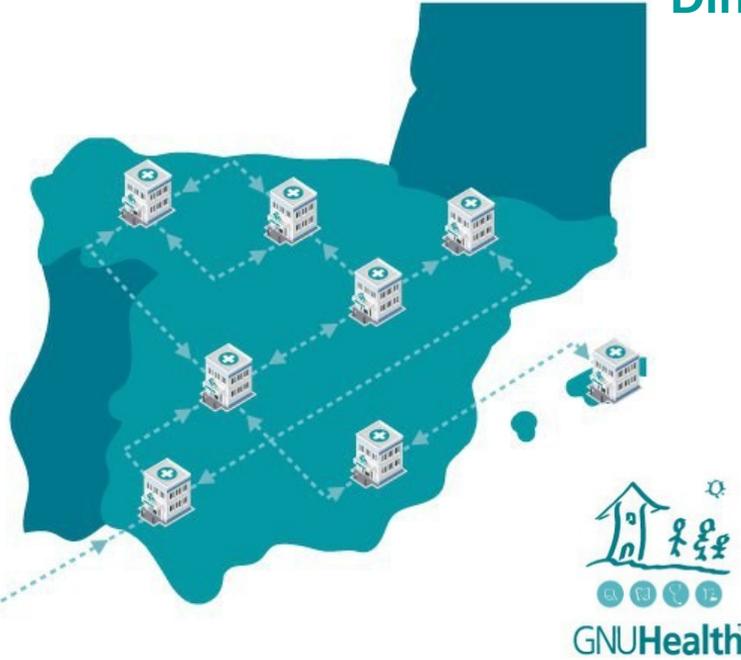
La persona como componente activo del sistema de salud

## Dinero Público, código Público!

**Software Libre:** No debe haber código escondido ni cajas negras en salud pública

La informática médica será un **bien público**

Ahorro de millones de Euros en licencias que se pueden destinar fortalecer el sistema público de salud



# La otra "federación" de GNU Health



GNUSolidario

GNU SOLIDARIO AROUND THE WORLD



GNUHealth



[WWW.GNUSOLIDARIO.ORG](http://WWW.GNUSOLIDARIO.ORG)

[WWW.GNUHEALTH.ORG](http://WWW.GNUHEALTH.ORG)

[INFO@GNUHEALTH.ORG](mailto:INFO@GNUHEALTH.ORG)

 GNU Health is part of GNU Solidario

# GNU Health es un proyecto social, con algo de tecnología



Santiago del Estero, Argentina, 2006

# Nos vemos en #GHCon2022, Gran Canaria !



[www.gnuhealthcon.org](http://www.gnuhealthcon.org)

# ¡Gracias!



[www.gnuhealth.org](http://www.gnuhealth.org)



[@gnuhealth](https://mstdn.social/@gnuhealth)

[@mastodon.social](https://mstdn.social/@mastodon.social)



[info@gnuhealth.org](mailto:info@gnuhealth.org)