FOSSCOMM 2021



MyGNUHealth and the GNU Health Ecosystem. The Importance of Free/Libre Software in the Public Health sector

Luis Falcon, MD











Agenda

- About GNU Health
 - History of the project & community
- The GH ecosystem components
 - The GNU Health Federation and its components
- MyGNUHealth
 - The GH Personal Health Record
- MyGNUHealth technical infrastructure
 - Framework and integration w/ GH Federation
- Q&A
 - Questions and answers



About me

Luis Falcón President, GNU Solidario Author of GNU Health falcon@gnuhealth.org

Education

- Computer Scientist
- Physician
- Genomics & Medical Genetics

Activism

- Social Medicine
- Animal Rights





History of GNUHealth and Community



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GNU Solidario

- Is the NGO behind GNUHealth
- Non-for-profit organization
- Works globally
- Focused on Social Medicine

Official GNU Project

- GNUHealth is an official GNU project
- Hosted at GNU Savannah
- Many mirrors around the World
- International community

From GNU Solidario





Group pic from GNUHealthCon 2018 in Canary Islands





Official GNU Package

Official GNU Package, from the Free Software Foundation Open Documentation Relies on free technology Friendly community







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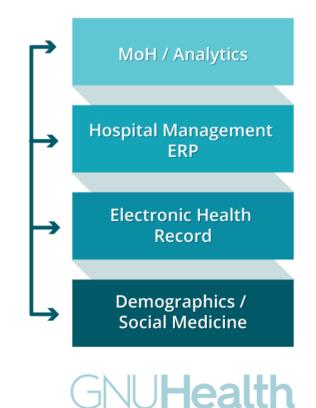


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GNU Health ecosystem





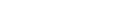






GNU Health Hospital Management snapshots

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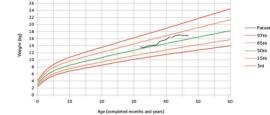
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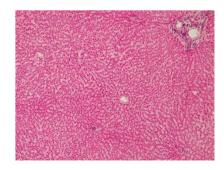




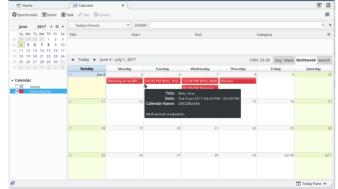
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GNU Health + Orthanc PACS Server

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Social Medicine & Health Informatics



GNU Health in Laos









GNUHealth

Jamaica Govt. Adopts GNU Health

GNU Health Goes to Jamaica !

GNUHealth



Started as a joint project between Government of Jamaica Ministry of Health and GNU Solidario

Local team

Sustainability and independence

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GNU Health in the heart of Africa























http://health.gnu.org



Clinics and Laboratories in Africa

GNU Health Implementation in Africa

• Ghana, Gambia, Cameroon, Gabon, Congo, Tanzania, Kenia, etc.



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GNUHealth





AIIMS, largest hospital in Asia



Red Cross Mexico





GNUHealth



United Nations University









World Health Organization - WHO



ICT for Improving Information and Accountability for Women's and Children's Heal

Immunization schedules

Malaria, TB and HIV modules List of Essential Medicines Tropical diseases ICD-10 ICPM Pediatric growth charts



Training session to WHO officials from western Africa



GNU Health implementation with WHO at Bafia general hospital

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Argentina: COVID-19 Observatory









IP COVID 19 -791 Dr Sassetti, Fernando

Universidad Nacional de Entre Rios

Implementación de un sistema de información sanitario basado en software libre (GNU Health) para la gestión de epidemias en municipios





Official GNU Package

Official GNU project Open Documentation Relies on free technology Friendly community







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GNUHealth ecosystem components



LABORATORY / LIMS



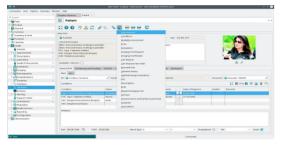


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GNUHealth HMIS component





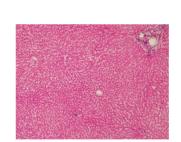


MoH / Analytics Hospital Management ERP **Electronic Health** Record Demographics / Social Medicine

GNUHealth



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MyGNUHealth: The Libre Personal Health Record



Empowering the person to be an active member in the System of Health

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K+R+G+P++

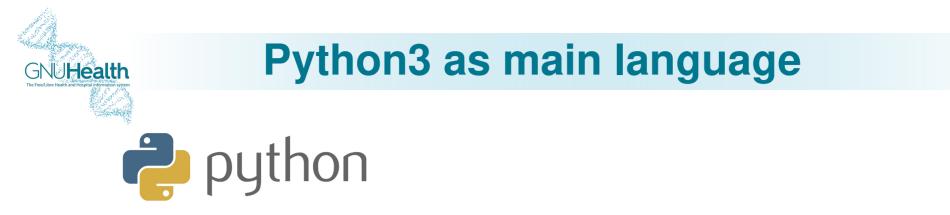






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Health



Python 3 is the main language used in most of GNU Health ecosystem components Most packages can be found at the **Python Package Index (PyPi)**



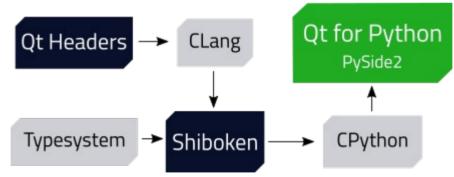








MyGNU Health is a Python3 application that uses the Qt framework



Source: https://doc.qt.io/qtforpython/shiboken2/shibokengenerator.html





MyGNUHealth is a convergent application



Set of QtQuick components to create convergent applications

Built on top of the QML language

MyGNUHealth is convergent. It adapts very well to desktops and mobile devices.

Qt for Python (PySide2)

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GNUHealth

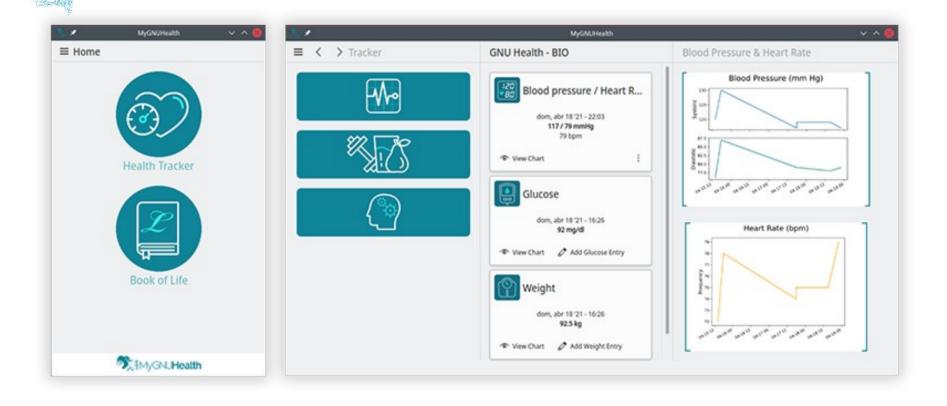


MyGNUHealth running on Desktop





MyGNUHealth on Desktop



GNUHealth



MyGNUHealth on the PinePhone

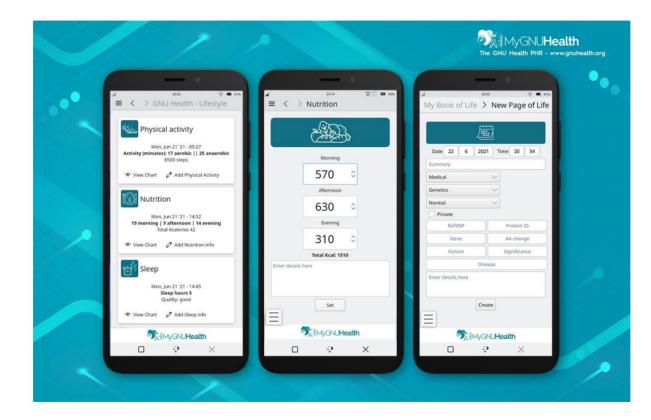


Hardware: PinePhone ("Braveheart") Qt5 Kirigami (set of QtQuick components)





MyGNUHealth on the PinePhone







MyGNUHealth running on the PinePhone



Current development environment:

Hardware: PinePhone ("Braveheart")

Qt5

Kirigami (set of QtQuick components)





Local Storage



MyGNU Health uses TinyDB for storage

Document oriented Database

JSON encoded

Python3 compatible

Platform independent

Easy to port from one device to another





GH Federation and MyGNUHealth



Nodes



Information System





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< > My	GNUHealth Settings	
	Profile	
	Network Settings	

< > Netwo	ork Settings	
Protocol	https	
Host	federation.gnuhealth.org	
Port	8443	
Fed. Acct	Federation ID	
Password	Password	
Sync		
	Test Connection	
	Done	

GNUHealth





MyGNUHealth nodes in the GH Federation



Highlights

Every person is a node

Realtime update with her health professional

Person is in control of what to share

Decrease the burden in the public health system

The person is now an active member in the public health system





GNUHealth in Medical Genetics and Cancer Research

GNU Health - admin@localhost/genetics - Administrator - GNU SOLIDARIO HTAL [Euro] $\sim \sim \infty$ s Window Help Variant Phenotypes 💈 🔢 Variant Phenotypes 17/40 Q BRCA1 × 🗉 O O Gene & Protein Phenotype Variant 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.Glu23Lvs DI-02602:Breast cancer BRCA1 (P38398) :breast cancer 1, early onset VAR 020683 : p.Asp749Tv 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 (O9BX63) (BRCA1 interacting protein C-t) VAR 020896 (p.Pro47Ala DI-02602:Breast cancer BRIP1 (O9BX63) (BRCA1 interacting protein C-ti VAR 020900 ; p.Met299Ile DI-02602:Breast cancer BRCA1 (P38398) :breast cancer 1, early onset VAR 007757 ; p.Cvs61Glv 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.Ser1217Tvr DI-01559:Breast-ovarian cancer, familial, 1 File Edit View Bookmarks Settings Help BRCA1 (P38398) :breast cancer 1, early onset VAR 020696 ; p.Phe1226Leu DI-01559:Breast-ovarian cancer. familial. 1 Angles: 0 Dihedrals: 0 Impropers: 0 Cross-terms: 0 Info) BRCA1 (P38398) (breast cancer 1, early onset VAR 020697 (p.Arg1243Gly DI-01559:Breast-ovarian cancer, familial, 1 Bondtypes: 0 Angletypes: 0 Dihedraltypes: 0 Impropertyp Info) BRIP1 (O9BX63) BRCA1 interacting protein C-te VAR 023700 ; p.Gln255His DI-01603:Fanconi anemia complementation gr info) Residues: 224 BRIP1 (Q9BX63) :BRCA1 interacting protein C-ti VAR_023702 : p.Ala349Pro DI-01603:Fanconi anemia complementation gr Info) Waters: 3 BRIP1 (Q9BX63) BRCA1 interacting protein C-te VAR_023703 : p.Trp647Cys DI-01603:Fanconi anemia complementation gr Info) Segments: 1 BRIP1 (O9BX63) (BRCA1 interacting protein C-t) VAR 023704 (p.Arg707Cvs DI-01603:Fanconi anemia complementation gr nfo) Fragments: 5 Protein: 2 Nucleic: 0

Connected

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Real-time observatory and reporting



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GNU Health Federation Community Hub



Community public server in Munich Demo and test environment Main Federation components:

- * HMIS node and PgSQL
- * Thalamus message server
- * Person / Patient Master Index HIS
- * openSUSE Leap OS

The GNU Health Federation Community Hub allows developers, health practioners and research institutions from all over the world to learn, test and develop their nodes & integrate them in the Federated network.



United Nations University, Kuala Lumpur, Malasia

Academia



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 9am – 11am ET (GMT -5) Room: 09-057



Harvard / MIT, Boston, United States



UNIVERSIDAD DE CIENCIAS MÉDICAS Matanzas

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Entre Ríos National University - UNER





GHCon2020



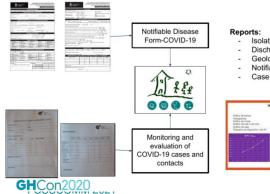






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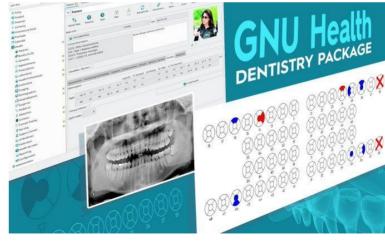
GNU Health COVID-19 Module



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- Isolation Certification. Discharge Certification.
- Geolocalization Maps
- Notifiable Disease Form
- Case and Contact Statistics









IFMSA Bangladesh



"Welcome IFMSA Bangladesh to the GNU Health Alliance of Academic and Research Institutions!"



3500+ Bangladesh medical students

65 universities

Focused on Primary Care

Exclusive use of Free/Libre Software





The GNU Health Alliance of Academic and Research Institutions





Alianza UNER

1- Operative Team



2- Municipalities Team









4 - Researchers

3- Support staff











Cancer as result of social injustice



IN SITU FL CÁNCER COMO INIUSTICIA SOCIAL

NATALIA LUXARDO · FERNANDO SASSETTI editores

LEANDRO ALVA JAVIER BILLORO U CILLA PASSERINO TERESITA CALZIA INGRID SPESSOTTI CARLOS SCOTTA JULIO CÉSAR BELLO MARCEL KOLVENBACH GIULIANA SANABRIA NÉLIDA ARNALDI DAIANA RETAMAR MARCELA BELARDO MARIANA BORDES NICOLÁS RODRÍGUEZ EUGENIA WRIGHT MARIANO TREACY

MIRIAM CORREA PRISCILA PESOA NADIA LEMOS GRISELDA ALZUGARAY NORMA YACUMINI CRISTIAN ALBORIXOZI JUANA ALBORIXOZI NICOLAS BERBERICH CRISTIAN CABRERA CARINA CABRERA MICAEL A CARCILA NO CAGAR RIQUELME SOLEDAD ZAPATA LUCIANA SANABRIA STELLA MARIS IBARRA GUILLERMO MACÍAS JOHANA BARRIO GRISELDA FACELLO LULANA TELATIN PAOLA WEINZETTEL CEGEILIA PALERMO FRANCISCO LÓPEZ MOIRA O'SHEE BIRKINFIELD ALEJANDRO NOBOJ MARINA SCHINDI CRISTINE HOLMBERGY MÁS...

PREFACIO: JAIME BREILH PRÓLOGO: CLAUDIO MARTYNIUK

Editorial Biblos

NATALIA LUXARDO es investigadora del Conicet en el Área Salud y Población del Instituto Gino Germani. Profesora en la carrera de Trabajo Social de la Universidad de Buenos Aires. Se dedica al desarrollo de investigaciones transdiciplinarias y colaborativas en los territorios, desde escalas de la indagación micro y centrada en poblaciones estigmatizadas v en contextos de vulnerabilidad y exclusión. Su línea de trabajo desde las últimas décadas versa sobre diferentes dimensiones relativas a las inequidades sociales. especialmente en salud.

FIBSM094355TII es bioingeniero (Universidad nacional de Entre Rios). Magister en Gestión de Sistemas y Servicios de Salud (Universidad Nacional de Kosario) y doctor en Ingeniería (Universidad Nacional de Litora). Es docente adjunto de Organización de los Sistemas de Salud de la carrera de Bioingenieria en la Facultad de Ingeniería (UNER). Participa como investigador en diversos proyectos liderados por Natalia Luxardo vinculados con el abordaje del cáncer en Argentina.



Dra. Natalia Luxardo Univ Buenos Aires CONICET



Dr. Fernando Sassetti Univ Entre Ríos Cátedra Salud Pública





Trailer documentary : https://vimeo.com/524433855

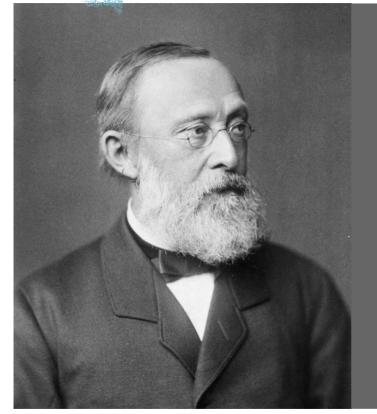
GNU Health was used to collect and process the demographic, clinical, epidemiological and socio-sanitary information from the participating centers

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Social Medicine



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

Rudolf Virchow







info@gnuhealth.org





