

eHST is a toolkit for rapid-prototyping and fast development for data analysis and decision support systems in eHealth and mHealth applications. It implements a range of algorithms and visual analytics approaches allowing personalised, predictive and preventive medicine approaches.

Main Features:

- Range of algorithms and AI techniques for personalised diagnostic and treatment support, patient stratification and predictive models
- Interactive and intuitive visual interfaces
- Configurable and reusable modules easily adaptable to different use cases (diseases, clinical specialties...)
- Integration with external 3rd party solutions & Electronic Health Record (EHR) systems using wide-use standards (HL7, FHIR, OpenEHR, SNOMED CT, ...)
- Scalable solutions from local to big data computing
- Transparent licensing schemes

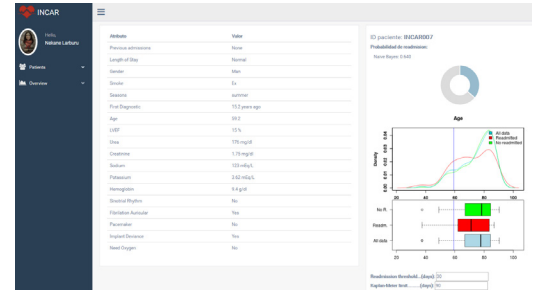
Applications

- Predictive Modelling & Patient Stratification
- Clinical Knowledge Extraction and Exploitation
- Guideline-based & Experience-based Clinical Decision Support Systems (CDSS)
- Authoring tool for CDSS
- Smart Electronic Health Record Systems & Semantic Web Technologies
- Patient Empowerment & Personalised Guidance
- Blockchain & Smart Contracts
- Data Curation

Use Cases

Heart Failure

- ✓ Readmission & real-time admission prediction of telemonitored heart failure patients



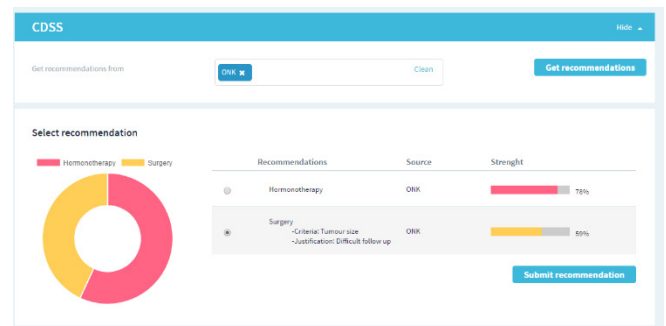
Diabetes

- ✓ Personal guidance of diabetes patients



Breast Cancer

- ✓ Guideline-based & Experience-based CDSS for Breast Cancer



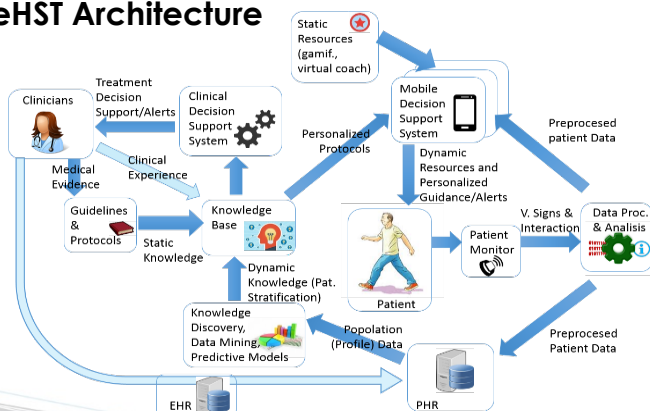
Training applications

- ✓ Pervasive Monitoring and classification of physical activity and ECG

Modules and Architecture

Module	Description	Dependencies*	Language
ehs_dem	Decisional Event Modelling	None	Java
ehs_cig	Clinical Guideline Formalization to Computer Interpretable Formats	HL7 – CDS	NRL, Java, XML
ehs_o2j	Ontology Handler	Protégé	Java, OWL
ehs_cdss	Adaptive Rule-based Decision Support System	Drools, Maven	Java, SQL, DRL
ehs_wfe	Web Front-end for Fast Prototyping	AngularJS	Javascript
ehs_va	Visual Analytics	Dash, Bokeh, Plotly	Python
ehs_app	Android App Fast Prototyping & Deployment	Android SDK, Retrofit	Java
ehs_fhir	FHIR Resource Repository & Exchange	REST HAPI, Tomcat	Java
ehs_pm	Predictive Modelling & Data Mining Algorithms	SCIKIT-Learn	Python, R
ehs_txc	Text Codification to Clinical Terminologies (SNOMED CT, UML)	IXA Pipes	Java

eHST Architecture



*eHST is structured into a small set of modules with minimal dependencies.

Supported standard formats:

- **Document streams:** any JSON or XML-encoded
- **Image formats:** DICOM, JPEG, TIFF
- **Terminologies:** SNOMED CT, CIE9/10
- **EHR standards:** HL7, OpenEHR, ISO13606

