

From on-premise to cloud—Hospitals to Universities



SECTRA

Sectra Medical Education

- » Johan Larsson, SW architect
- » Three-person development team
- » Serving the global medical education market



SECTRA

Today's topic

From product that is

- On-premise

- Clinical

- Aimed at professionals

To a product that is

- Available as a service

- Educational

- Aimed at students



The ideal educational tool

- » Availability & Deployment
- » Ease of use
- » Content



The PACS



On-premise installation



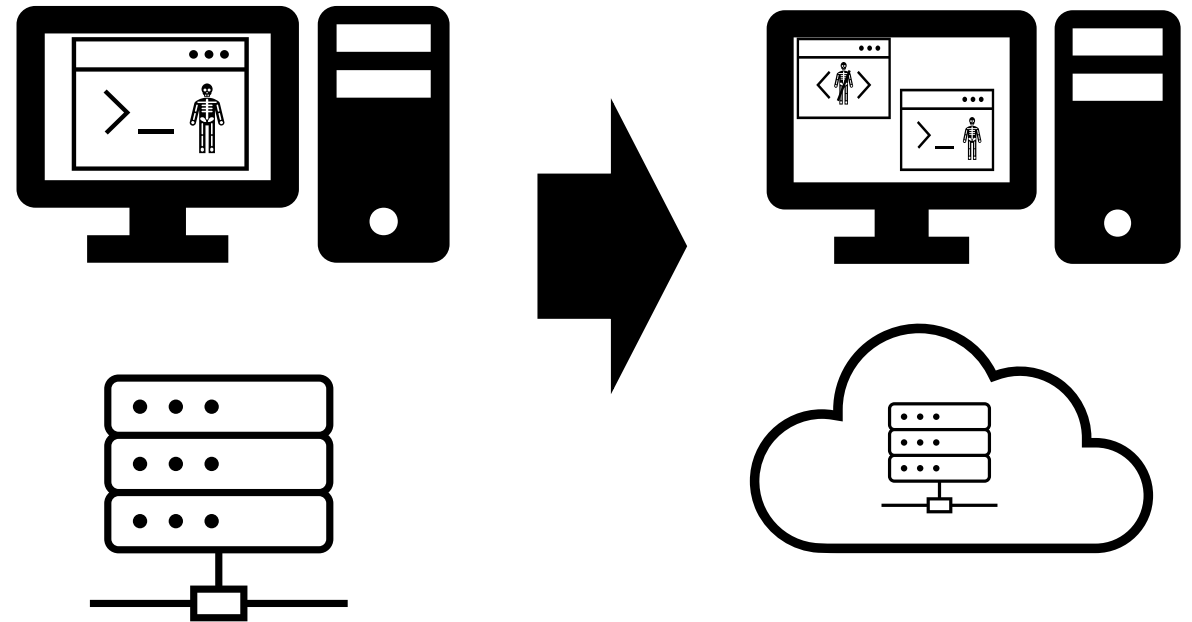
Comprehensive feature set



Intended for clinical use

The how

- » Adapting the PACS?
 - » Branching
 - » Medical processes
 - » Release cadence
- » Build a web layer
 - » Bridge the gaps
 - » PACS client as a service



Starting out

- » Leave the PACS intact
 - » But build a simpler UI
- » Put it in a cloud instance
- » Create a web service for launching the client
 - » User and login handling
 - » One-click launch



Gap analysis



Workflow differences

Clinical:

- » Patient focused
 - » Avoid switching between patients
 - » Identity and history clearly available
- » Adding/editing data
 - » Create new cases
 - » Requests and reports between professionals

Educational:

- » Typicality focused
 - » Find similar or typical cases
 - » Anonymized cases
- » View data
 - » Presentations shown by one professional to many students
 - » View images without editing

Deployment differences

Clinical:

- » System available on premise
 - » Local server
 - » Controlled clients
 - » Local installations
 - » Local users
- » Managed installation
- » Windows only

Educational:

- » System available everywhere
 - » Cloud based
 - » Arbitrary clients
 - » No local installs
 - » Multi tenant user handling
- » Instant deployment
- » Windows, MacOS, Android... Linux?
FreeBSD?

Where the road takes us

- » Thing we've done
- » Evaluate
- » New direction



Solving the biggest problem first - finding cases

- » PACS UI is not suited for finding types of cases
- » A lot of information, but no overview
- » Focused on patients

FAVORITES ▾
Drop your most commonly used worklists here

ALL WORKLISTS
▼ System Worklists

- All Public Cases
- New Public Cases in EP
- Recommended Cases
- Share in Progress
- AMC Embryology
- Cases by Body Region
- Cases by Medical Specialty
- Cases by Modality
- Cases by System
- Histopathology Cases
- Monash University 3D Anatomy Series
- Recommended Cases

- Role Worklists
- User Worklists

History
Search Results
Local Exams

All Public Cases 828 patients, 860 examinations

297 CT 17 MR 516 SM 17 OT 1XA 4 US

Status	Name ↑1	Sex	Modality	Body part	D	Institution ↑2	Downloa..
Public	S092 Abdominal & Pelvic Cavity	F	CT	ABDOMEN & ...	C.	Sectra	0 %
Public	S093 Thorax & Abdomen E	O	CT	THORAX, ABD...	T.	Sectra	0 %
Public	S094 Shoulder	O	CT	UPPER LIMB	S.	Sectra	0 %
Public	S095 Thorax D	O	CT	THORAX	T.	Sectra	0 %
Public	S096 Heart I	O	CT	HEART	V.	Sectra	0 %
Public	S097 Thorax & Abdomen F	O	CT	THORAX, ABD...	G.	Sectra	0 %
Public	S098 Carpus	O	CT	UPPER LIMB	O	Sectra	0 %
Public	S099 Neck & Thorax	O	CT	HEAD, NECK ...		Sectra	0 %
Public	S100 Thorax, Abdomen & L Limb	O	CT	THORAX, ABD...		Sectra	5 %
Public	S101 Thorax & Abdomen G	F	CT	THORAX, ABD...	T.	Sectra	31 %
Public	S102 Hip, Knee, Feet	M	CT	LOWER LIMB	A.	Sectra	0 %
Public	S103 Knee B	O	CT	LOWER LIMB	K.	Sectra	0 %
Public	S104 Head B	F	CT	HEAD	C.	Sectra	4 %
Public	S105 Head C	F	CT	HEAD	C.	Sectra	3 %
Public	S106 Descending Aorta	M	CT	ABDOMEN	T.	Sectra	6 %
Public	S107 Peripheral Angiography	M	CT	PELVIS & LOW...	A.	Sectra	0 %
Public	S108 Neck Angio B	F	CT	HEAD & NECK	A.	Sectra	0 %
Public	S109 Abdomen F	M	CT	ABDOMEN & ...	T.	Sectra	6 %
Public	S110 Thorax E	M	CT	THORAX	T.	Sectra	0 %
Public	S111 Peripheral Angiography B	M	CT	PELVIS & LOW...		Sectra	0 %
Public	S112 Thorax & Abdomen H	F	CT	THORAX, ABD...	A.	Sectra	0 %
Public	S113 Thorax F	M	CT	THORAX	A.	Sectra	0 %
Public	S114 Teeth	M	CT	NECK	T.	Sectra	0 %
Public	S115 Abdomen G	F	CT	ABDOMEN		Sectra	0 %

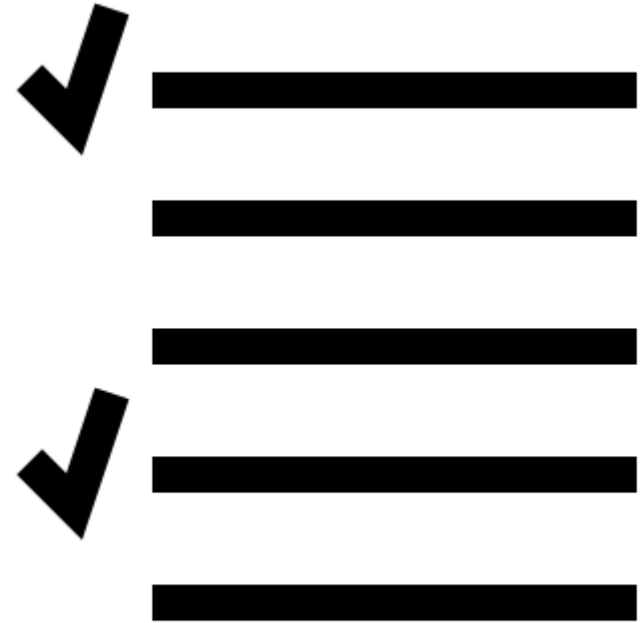
Patient History 1 examination, 1 matching Filter

↑2	Date and time ↓1	Modality	Body part	Description	Institution	Comments
▶	2014-07-22, 11:48	CT	THORAX, AB...	T.A.C. DE TORAX	Sectra	

Images in HqPrf_E05G0FA18M

Solving the biggest problem first - finding cases

- » Create a separate case database
 - » References to PACS data
 - » Categorized by typicality
 - » Add descriptions and thumbnails
- » Build a gallery to find cases
- » Launch PACS client from gallery



Filters

Search



Head and Neck

1 - 24 out of 344

Areas

Body Region

Head and Neck

System

Medical Specialty

Collections

All

Normal

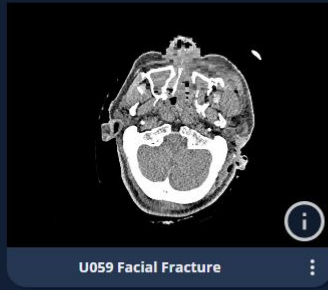
Pathological

Type

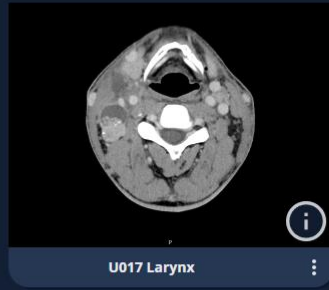
Content Format

Show unsupported content

Clear all filters



U059 Facial Fracture



U017 Larynx



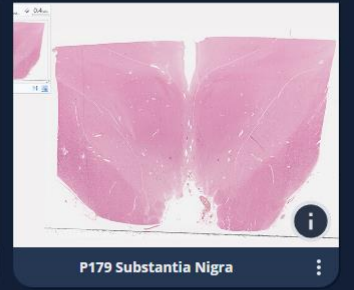
M007 Head, Neck, Pharynx



U061 Abscess Neck



S032 Neck Angio



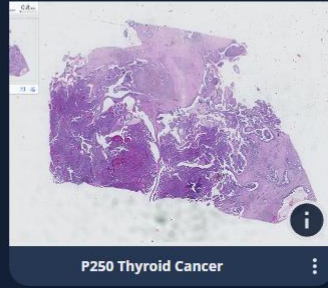
P179 Substantia Nigra



M007 Head, Neck, Pharynx



S059 Facial Fracture



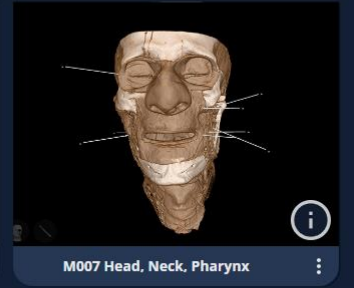
P250 Thyroid Cancer



S032 Neck Angio



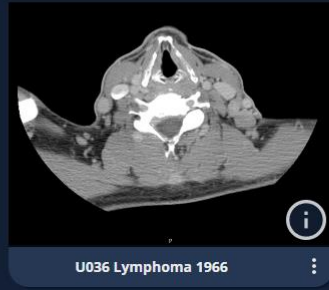
M001 Head Neck Shoulders



M007 Head, Neck, Pharynx



M005 Dural Skull



U036 Lymphoma 1966



U033 Cervical Fractures



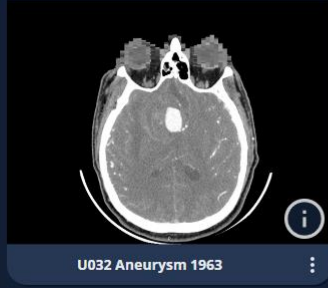
M006 Head, Neck, Face



P027 Oral Epithelial Cells



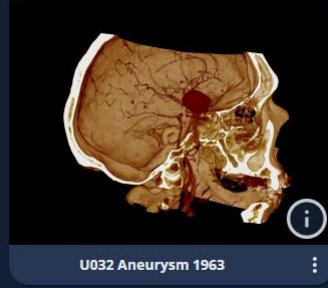
C108 Brain Glioblastoma A



U032 Aneurysm 1963



S038 Cerebral Infarction



U032 Aneurysm 1963



S059 Facial Fracture



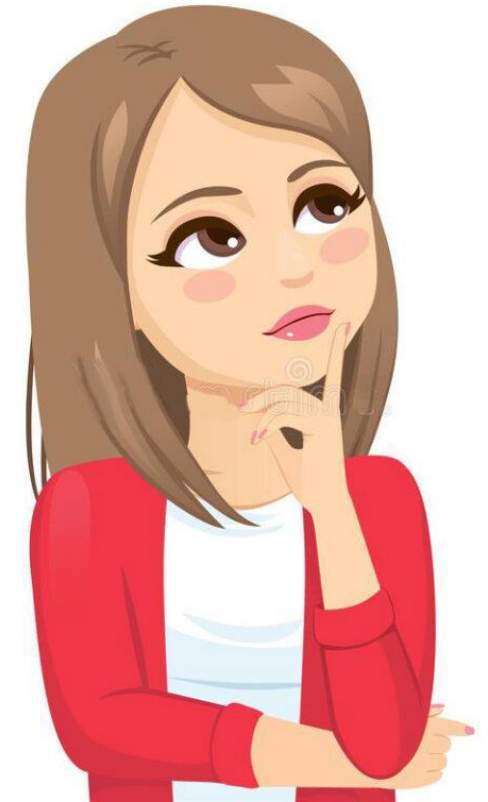
P175 Cerebral Cortex (oligodendrocy...



M001 Head Neck Shoulders

Reevaluating our vision

- » Managing applications is inconvenient
- » Launching the PACS client requires Windows
- » PACS development is expensive
- » Students do not need the full client



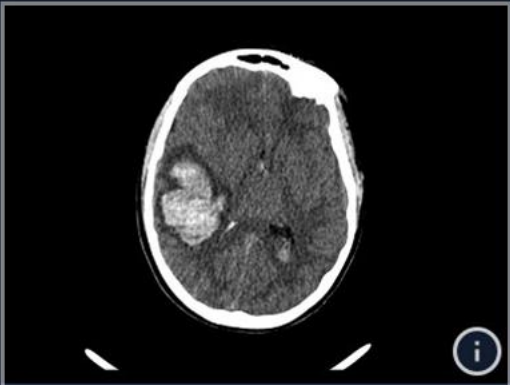
Applications

Filters

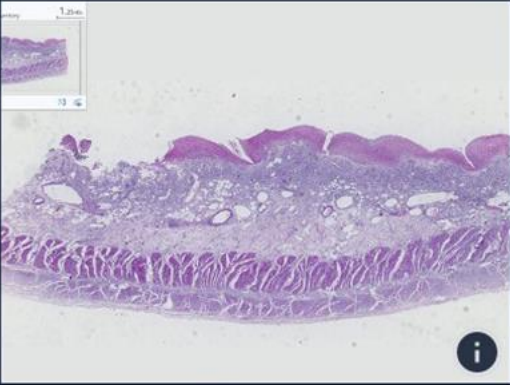
Search



1 - 24 out of 1098



S035 Cerebral Hemorrhage



P318 Bacillary Dysentery



S035 Cerebral Hemorrhage

Sectra

Slice: 2 mm

C: 45.0, W: 75.0

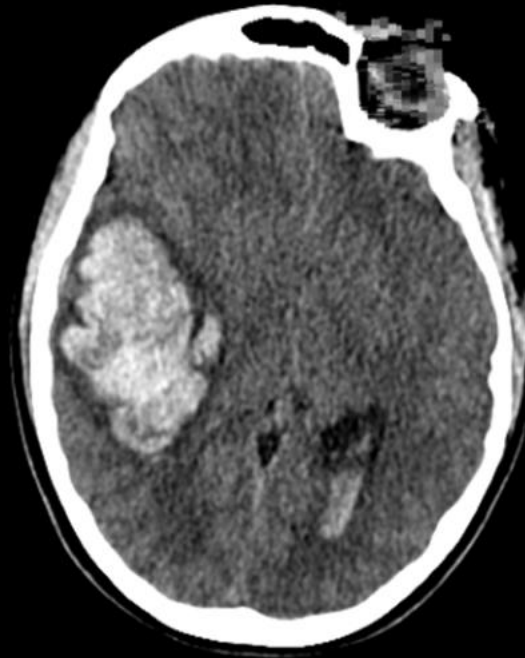


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Image 83 of 151



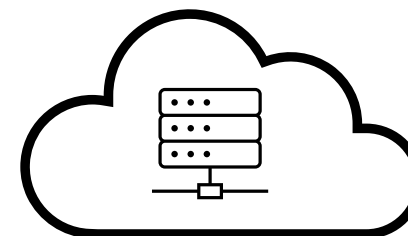
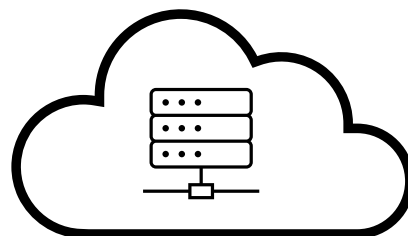
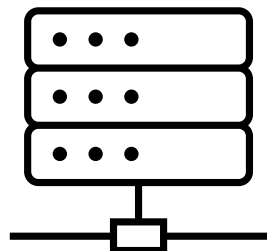
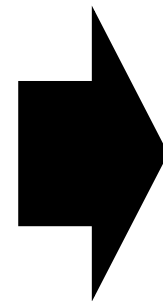
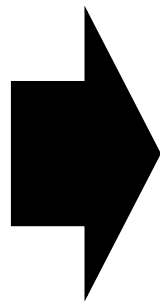
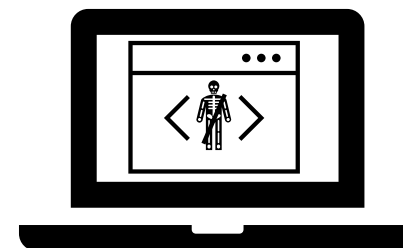
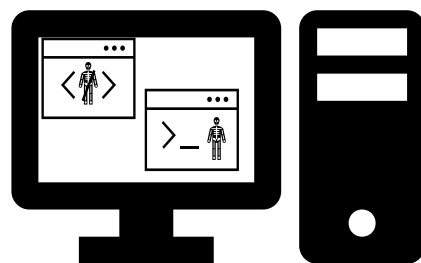
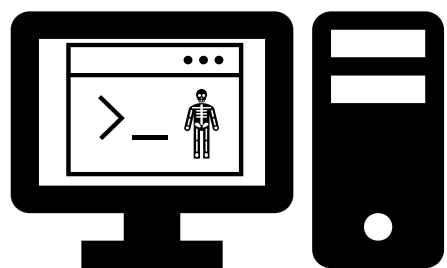
S035 Cerebral Hemorrhage

This case shows a T1 weighted MR scan of the brain and spinal cord. Case Features: Cerebrum, cerebellum, spinal cord, ventricles, pituitary gland, cervical intervertebral discs.

Close



PACS as (just) a data service



Advanced use cases

- » 3D, MPR
- » Clinical simulations
- » Using real hardware



Next step

Conclusion

- » Different audiences require different products
- » Preserve the original functionality
- » Replace the parts you need piece by piece
- » Reevaluate your vision often



SECTRA

Knowledge and passion

Johan Larsson
Software Architect