Telemeta
Open and collaborative web audio platform for digital sound archive management

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Main goals

- Archive, preserve and scale big audio data and related metadata
- Process audio data on demand through a modular architecture
- Play audio data and read metadata synchronously
- Index and share music data through a collaborative web app
- Link audio data to various ontologies, external services and related medias (photos, videos, etc)
- Manage users, share and access rules, copyrights easily through time

History of the project

- 2006: definition of the goals (open source web audio collaborative platform)
- 2007: first partner: french Research Center of Ethnomusicology (CREM)
- 2007 - 2009: technical specifications, definition of the DB migrator
- 2008: prototype development
- 2008 - 2010: workflow and format specifications
- 2011: development, final migration and release of Telemeta 1.0 to the CREM for production : http://archives.crem-cnrs.fr
- 2011 - 2014: collaborative indexing, more development, massive data imports...

CREM's platform

CREM
Centre de Recherche en Ethnomusicologie

Recherche

Bienvenue, Guillaume Pellerin | Profil | Aide | Déconnexion

Bureau | Archives | Géo-Navigateur | Recherche avancée | Utilisateurs | Admin

Archives sonores du CNRS - Musée de l'Homme

Le fonds d'archives sonores du CNRS – Musée de l'Homme rassemble des enregistrements inédits et publiés de musique et de traditions orales du monde entier, de 1900 à nos jours. Constitué de supports variés (cylindres, 78 tours, disques vinyles, cassettes, supports numériques), ce fonds se positionne parmi les plus importants d'Europe en terme de qualité, de quantité et de diversité.
Pour une présentation historique du fonds, voir le site du CREM.

Contenu

Géré par le Centre de Recherche en Ethnomusicologie (CREM) cette base de données répertorie :

✔ Plus de 30 000 documents inédits, dont les 2/3 sont sonorisés, répartie dans plus de 1 000 collections, représentant près de 4 000 heures d'enregistrements de terrain non publiés.
✔ Plus de 13 000 enregistrements édités, dont 3 000 sonorisés, dans plus de 4 600 collections, pour environ 3 700 heures (incluant plus de 5 000 disques dont beaucoup sont très rares).
✔ 199 pays sont représentés à travers plus de 1 200 groupes ethniques ou sociaux, donnant à entendre une large palette d'expressions musicales et chantées, de langues et de dialectes.

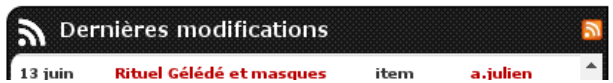
Certains enregistrements sont consultables avec un code d'accès. Pour l'obtenir écrivez à crem.lesc (at) mae.u-paris10.fr en expliquant les motifs de votre demande. Le fonds d'archives est également consultable sur les postes dédiés disponibles au CREM, à la Bibliothèque Eric de Dampierre, à la Médiathèque du Musée du Quai Branly et à la Bibliothèque du Muséum National d'Histoire Naturelle.

Organisation du catalogue

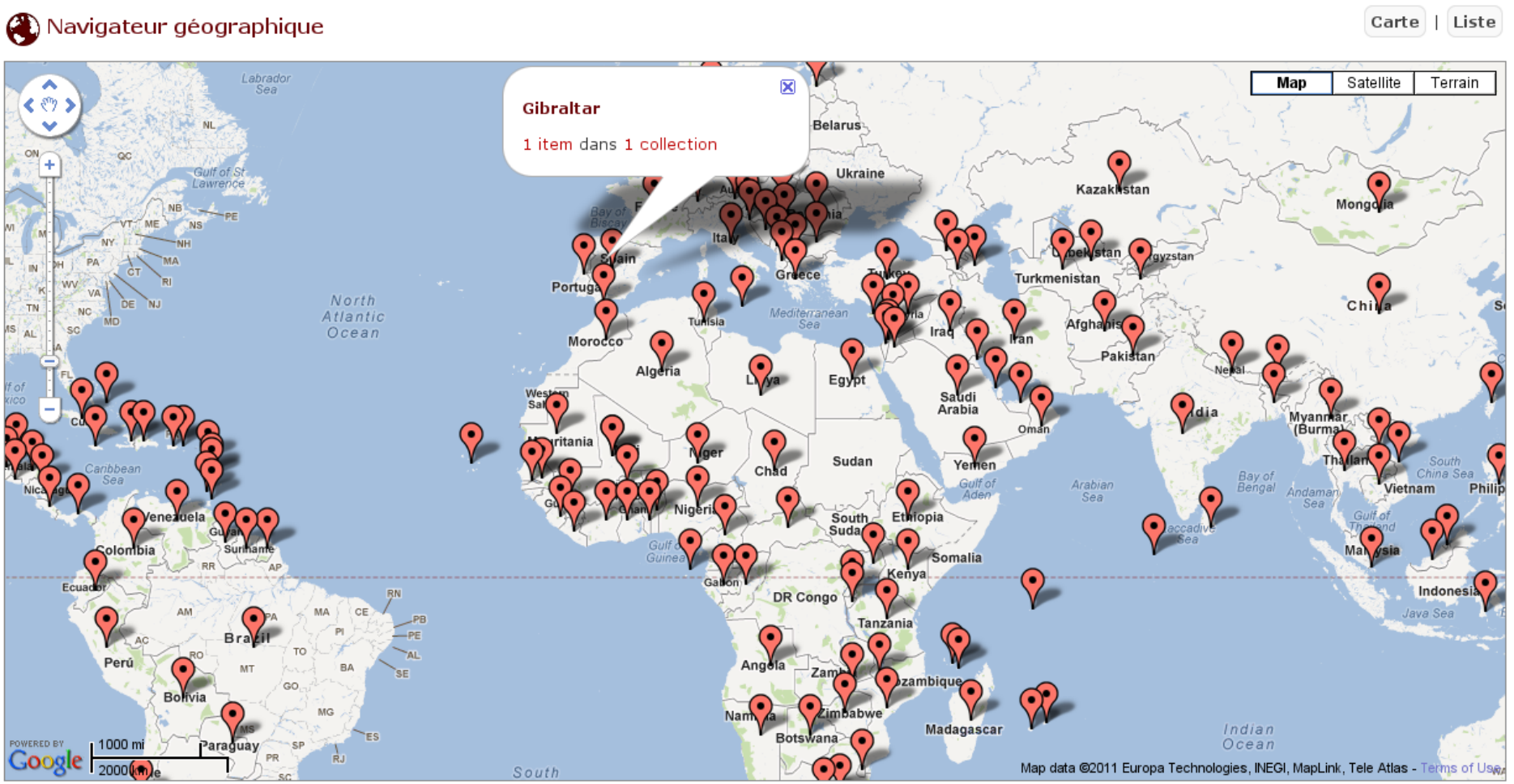
Le catalogue est organisé en 4 niveaux : Fonds, Corpus, Collection et Items. Le niveau principal de description est la Collection. Chacune regroupe un ensemble cohérent de fichiers audio (items) correspondant le plus souvent à des enregistrements collectés au cours d'une même mission de recherche ou à un disque publié. Certaines collections sont elles-mêmes regroupées en corpus et en fonds associés à des collecteurs.

Le nombre d'enregistrements mis en ligne sur la plateforme est en constante augmentation. Les fiches descriptives sont renseignées de manière collaborative par les usagers de la plateforme : chercheurs, étudiants, documentalistes.

Le CREM accueille toutes les collaborations visant à enrichir et valoriser ce précieux patrimoine. Ecrivez-nous à crem.lesc (at) mae.u-paris10.fr.



CREM's Geo-navigator



Extend the usecases

Usages

- Research and share audio data and collaborate online and with other researchers or communities.
- Teach with music and audio materials for lessons, academic works and exams.
- Publish documented audio ressources from interactive kiosks (full access given to IP ranges)

Domains

- Musicology
- Anthropology
- Museology
- Computer science
- Biology
- Ecology

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2 Framework
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3 Related projects
- TimeSide
- SABIOD
- DIADEMS

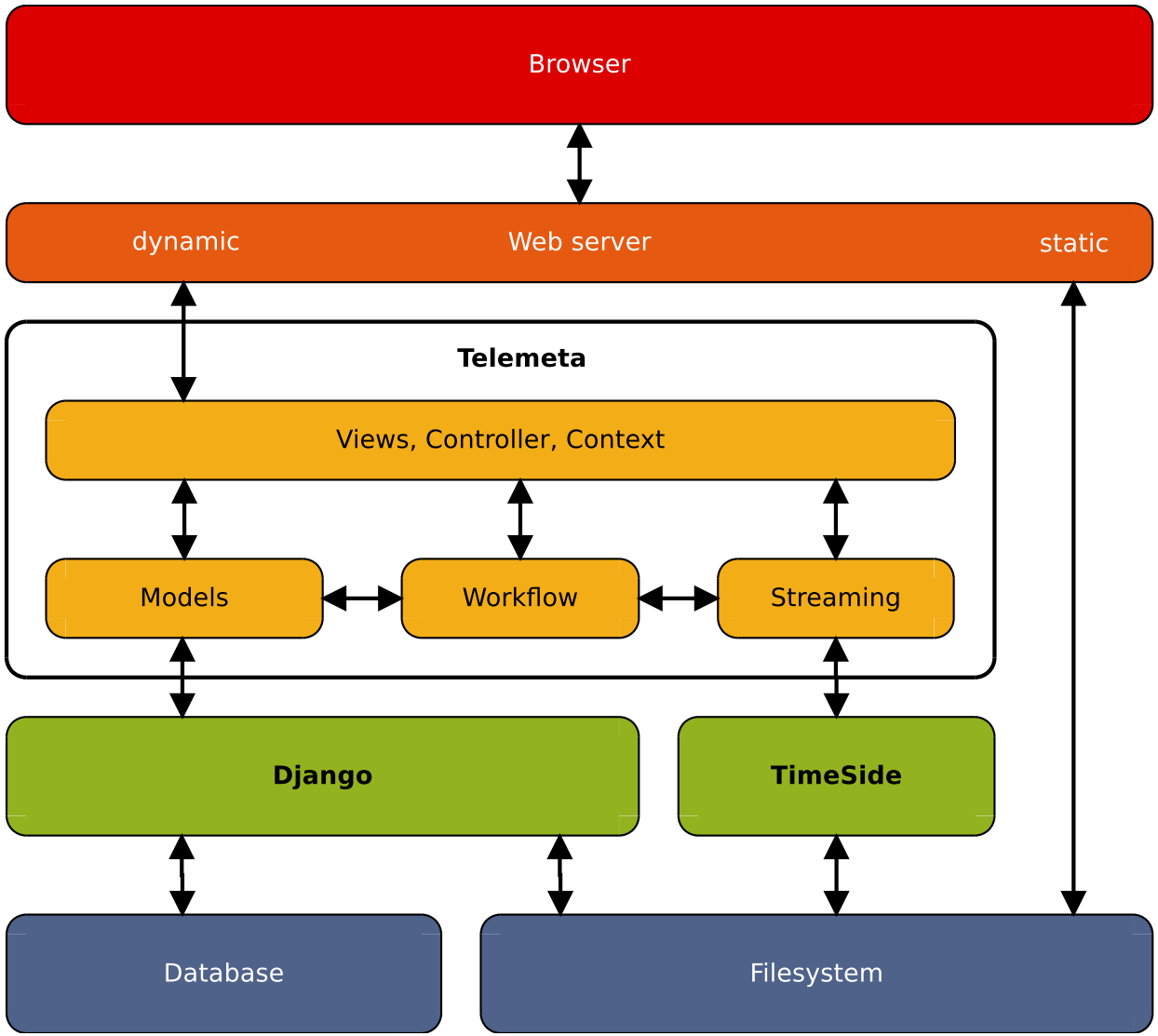
4 Development

Technologies

100% 0pen Source!

- Python : cool and smart object oriented language
- Django : high-level web MVC framework
- GStreamer : open source multimedia framework
- TimeSide : open web audio processing framework
- MySQL, PostgreSQL, others : relational databases
- GNU / Linux : applications, libraries and kernel

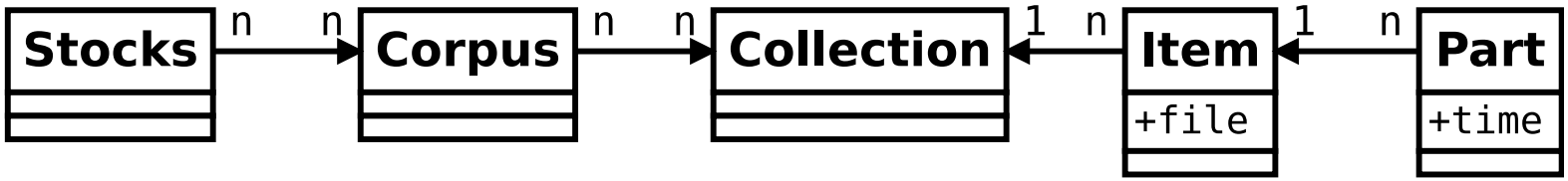
Architecture



Key features

- Pure HTML5 web user interface including dynamical forms and smart workflows
- On the fly audio analyzing, transcoding and metadata embedding in various formats
- Social editing with semantic ontologies, smart workflows, realtime tools, human or automatic annotations and segmentations
- User management with individual desk, playlists, profiles and access rights
- High level search engine (geolocation, instruments, ethnic groups, etc...)
- Data providers : DublinCore, OAI-PMH, RSS, XML, JSON and other
- Multi-language support (now english and french)

Data model



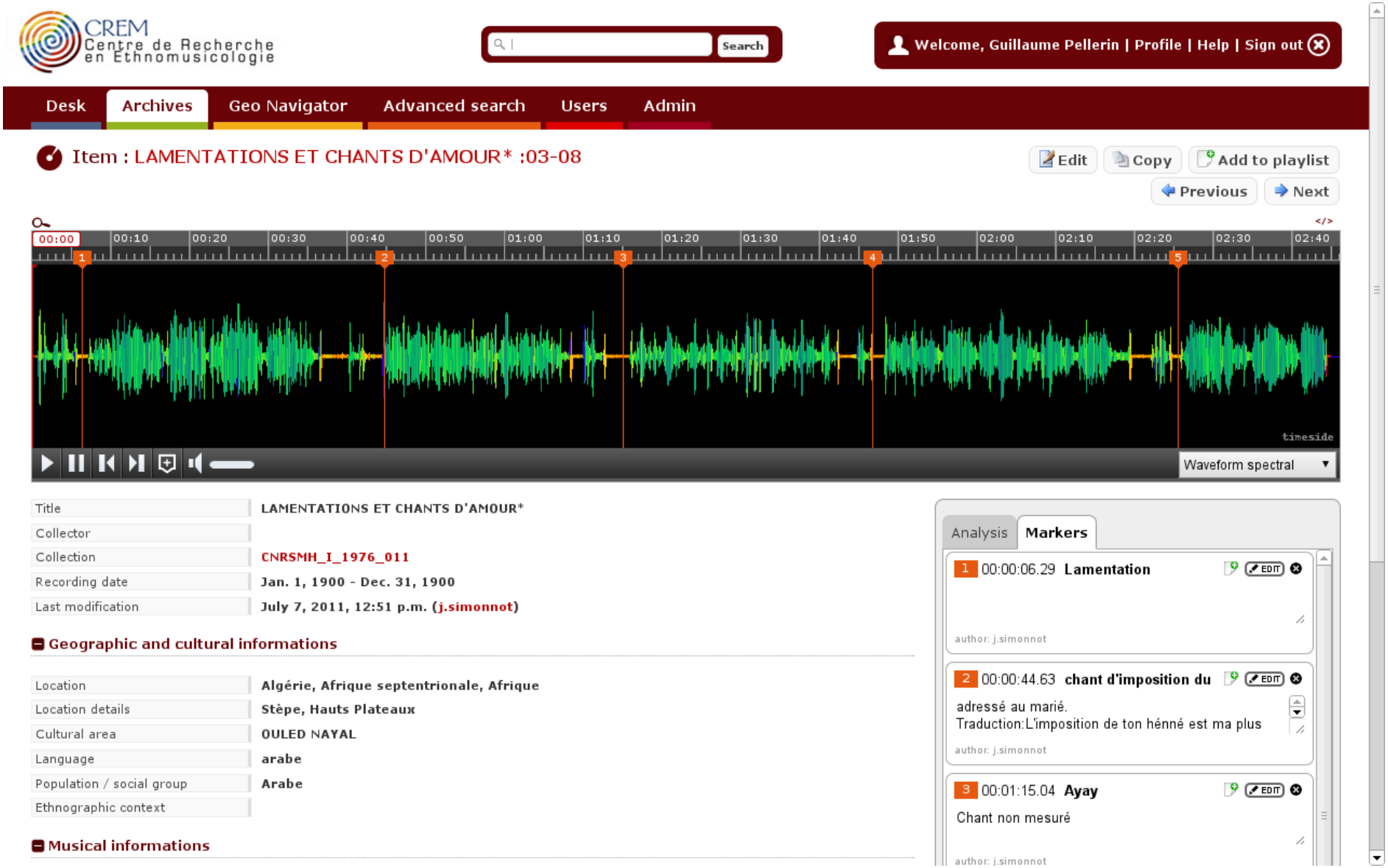
Other objects

- Instrument, InstrumentAlias, InstrumentRelation, InstrumentAliasRelation, Performance
- Location, LocationAlias, LocationRelation, LocationAliasRelation
- EthnicGroup, Format, PhysicalFormat, Publisher and various other Enumarations (1D lists)
- Language (ISO 639-3)
- Revision, PlayList, Profile, etc...

All objects

view online PDF

Web User Interface



http://archives.crem-cnrs.fr/archives/items/CNRSMH_I_1976_011_003_08/

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TimeSide : open web audio processing framework

Server side - TimeSide Engine

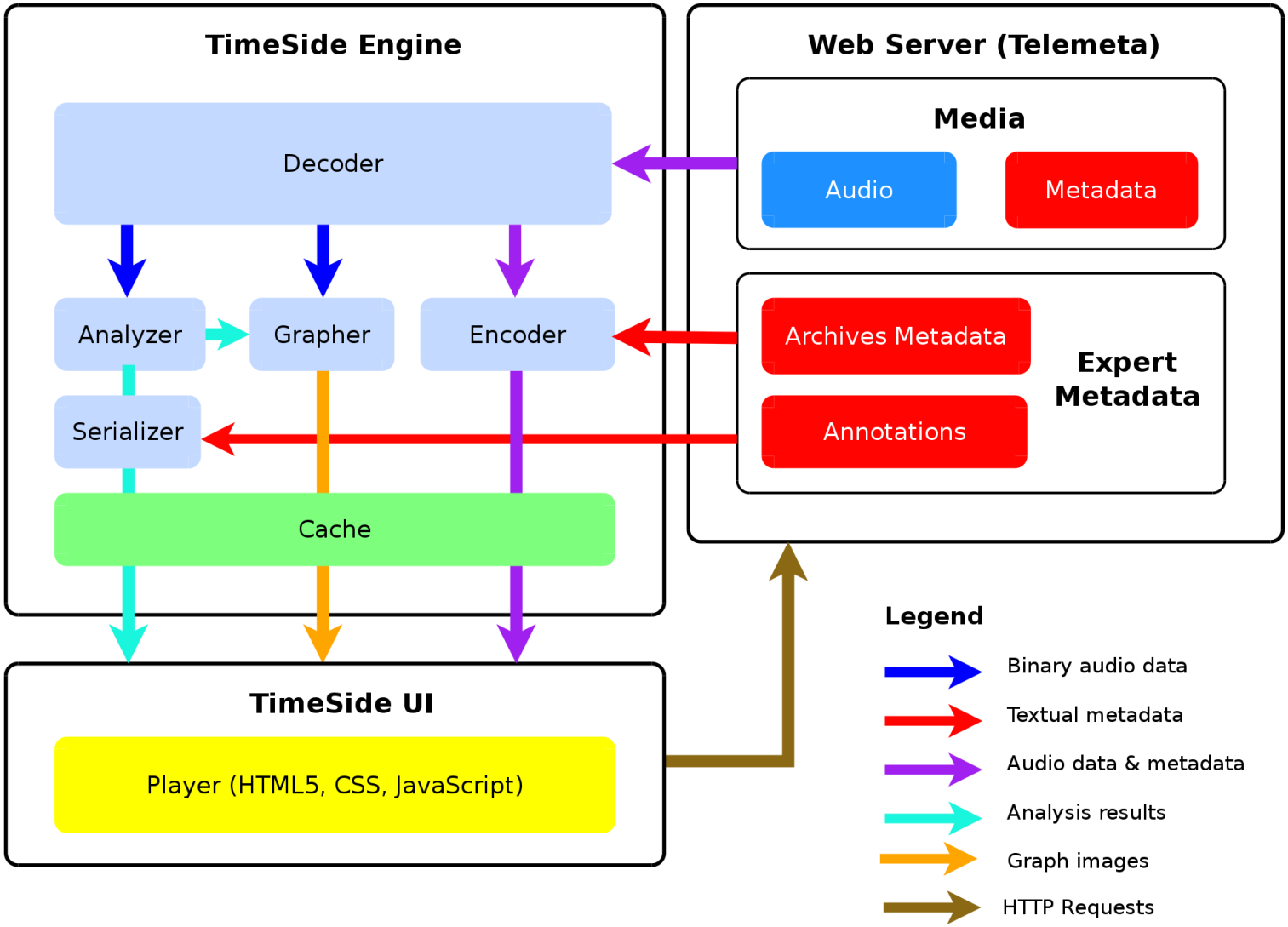
- Do asynchronous and fast audio processing with Python,
- Decode audio frames from ANY format into numpy arrays,
- Analyze audio content with state-of-the-art audio feature extraction libraries (Aubio, Yaafe, Vamp (experimental),
- Organize, serialize and save analysis metadata through various formats,
- Draw various fancy waveforms, spectrograms and other cool graphers,
- Transcode audio data in various media formats and stream them through web apps,

Client side - TimeSide UI

- Playback and interact on demand through a smart high-level HTML5 extensible player,
- Index, tag and organize semantic metadata

  (see Telemeta which embeds TimeSide).

TimeSide - Architecture



SABIOD: Scaled Acoustic Biodiversity (prototype)

SABIOD.ORG
Scaled Acoustic Biodiversity
Mastodons Big Data

Search

Welcome, Guillaume Pellerin | Help | Sign out

Desk | Archives | Geo Navigator | Advanced search | Admin

SABIOD - Scaled Acoustic BIODiversity platform

Bioacoustic signaling is a primary mode of communication and exploration for most of the animals. It enables quick load and transfer of information without any visible contact with the target, tackling the reduced visibility of deep forest (insect, frogs, birds, mammals...), cave or night activities (insects, bats), and/or the long distances like in ocean (krill, fishes, whales...). Bioacoustics is also one of the factors in optimizing natural selection, playing a significant role in signalling resource qualities to potential partners.

The SABIOD project aims to detect, cluster, classify and index bioacoustic big data in various ecosystems, at different space and time scales, in order to reveal informations on the complex sensori-motor loop, and on the health of an ecosystem, yielding to new biodiversity insights.

Keywords : Acoustics, Signal Analysis, Machine Learning

NEWS

- Internatinal Workshop on Neural Information Scaled to Bioacoustics (joint to NIPS 2013) 10th dec - deadline ext. abstract 13th oct.
- IEEE ATSIP'14 last CFP - Special session on Bioacoustics Int. conf. on Ad. Tech. for Signal & Image Processing

The Telemeta Platform

The collaborative platform Telemeta aims to make sound archives available to researchers and to the extent possible, the public, in compliance with the intellectual and moral rights of collectors. Developed with the support of the program TGE-Adonis of the CNRS, allows researchers to exchange data online with communities, including through collaborative tools like markers , spaces, comments, etc...

CREDITS

SABIOD is a CNRS Big Data Interdisciplinary project 2012-2014

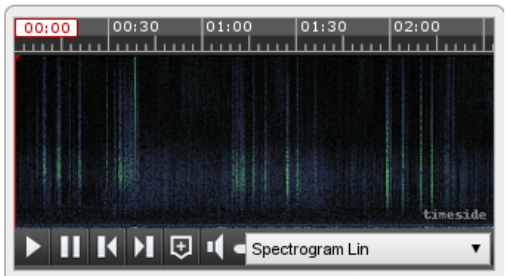
Laboratories : LSIS, LIP6, CNPS, MNHN, LIG, Géoazur

Laboratoire des Sciences de l'Information et des Systèmes | CNPS Centre de Neurosciences Paris-Sud | LIP6 | Muséum National d'Histoire Naturelle | LIG | GeoAzur Terre - Océan - Espace | IUF | CNRS

Sounds selection

Sound selection

SABIOD_NIPS4B_Indian_River_Lagoon_file0006



Last changes

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Jan. 22, 2014, 11:23 p.m.	Chaffinch call	marker	t.fillon
Jan. 22, 2014, 11:23 p.m.	Chaffinch call	marker	t.fillon
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Jan. 22, 2014, 11:22 p.m.	Chaffinch call	marker	t.fillon
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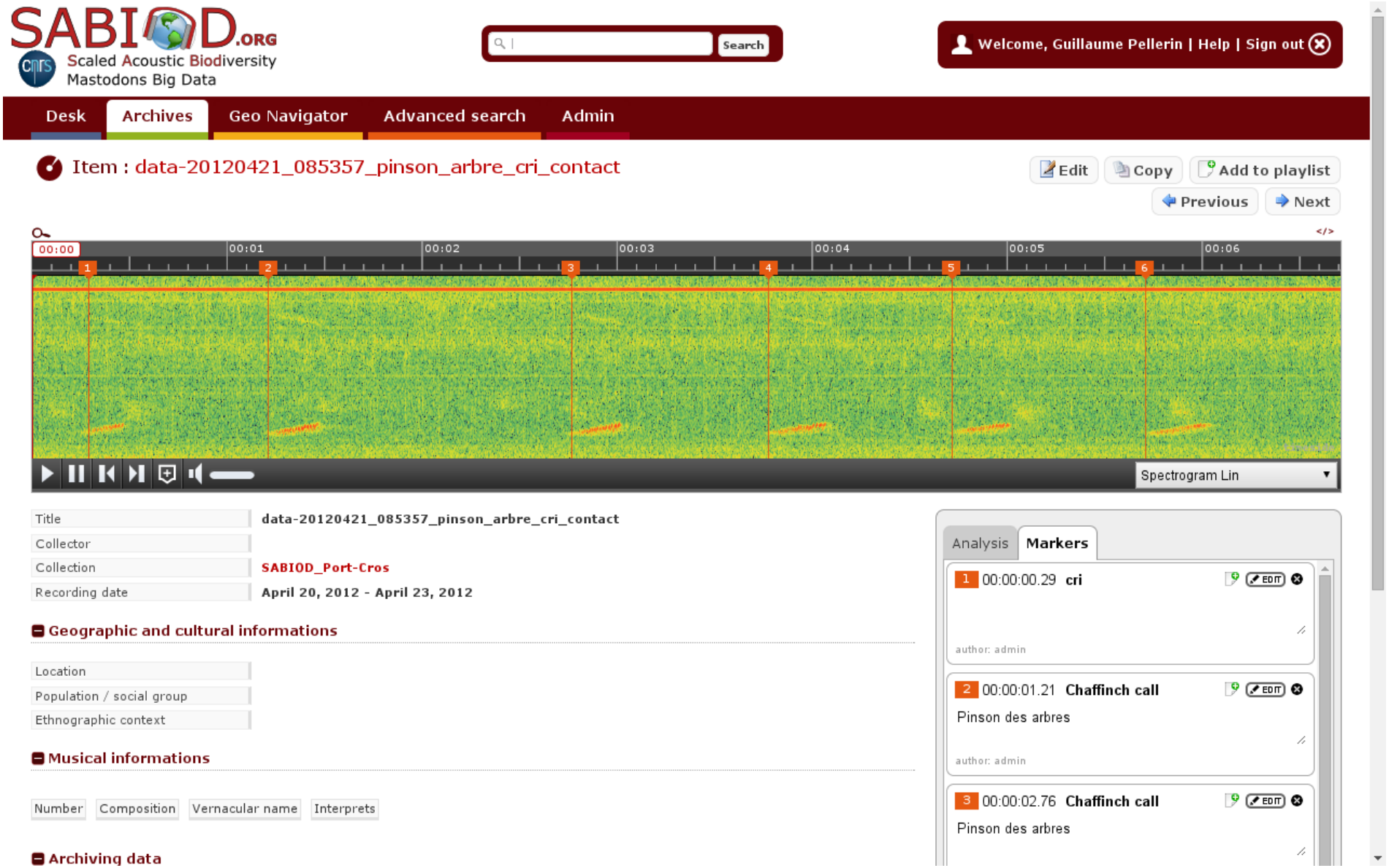
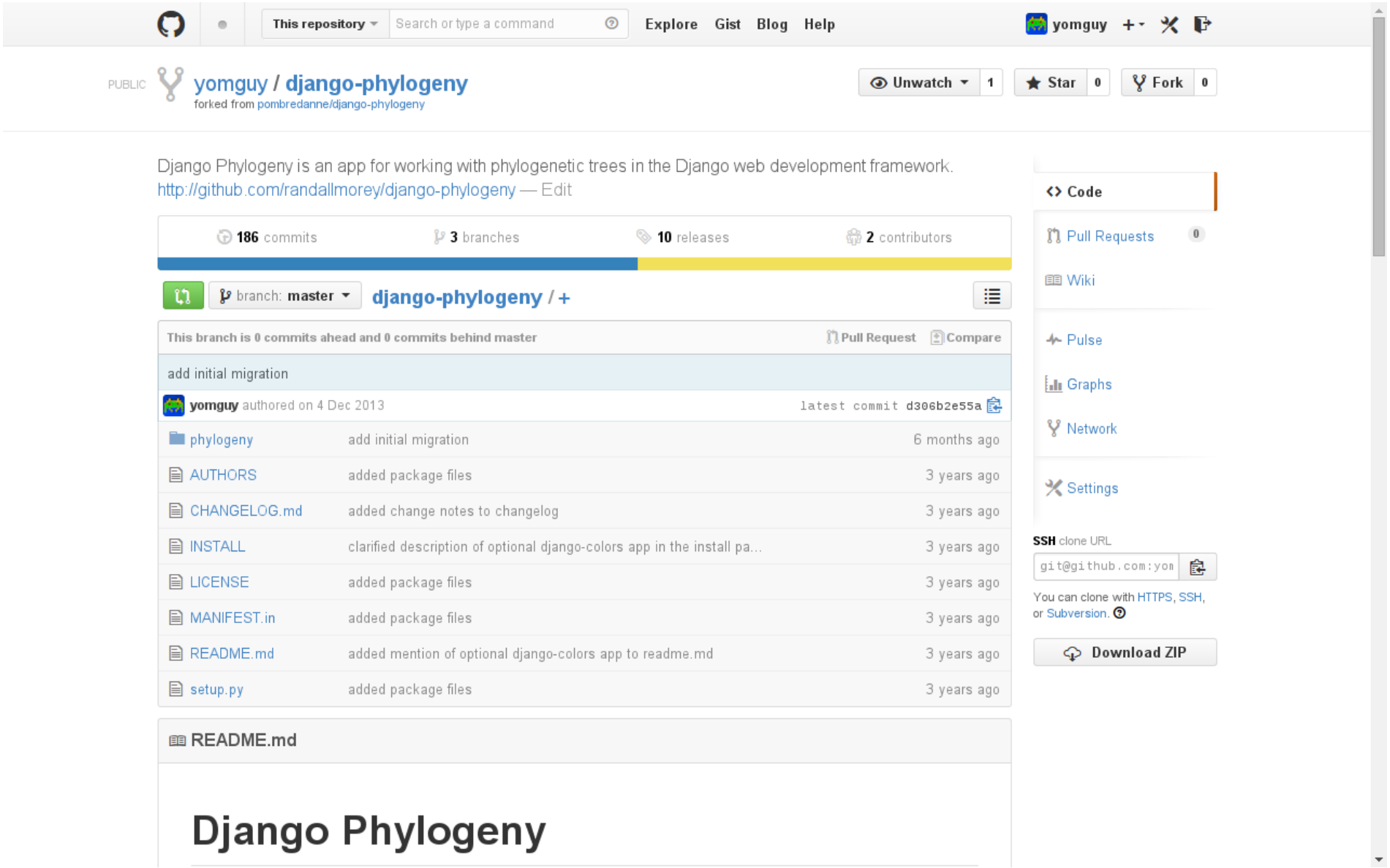
Telemeta Partners

SABIOD: Scaled Acoustic Biodiversity (prototype)



SABIOD: Scaled Acoustic Biodiversity (prototype)



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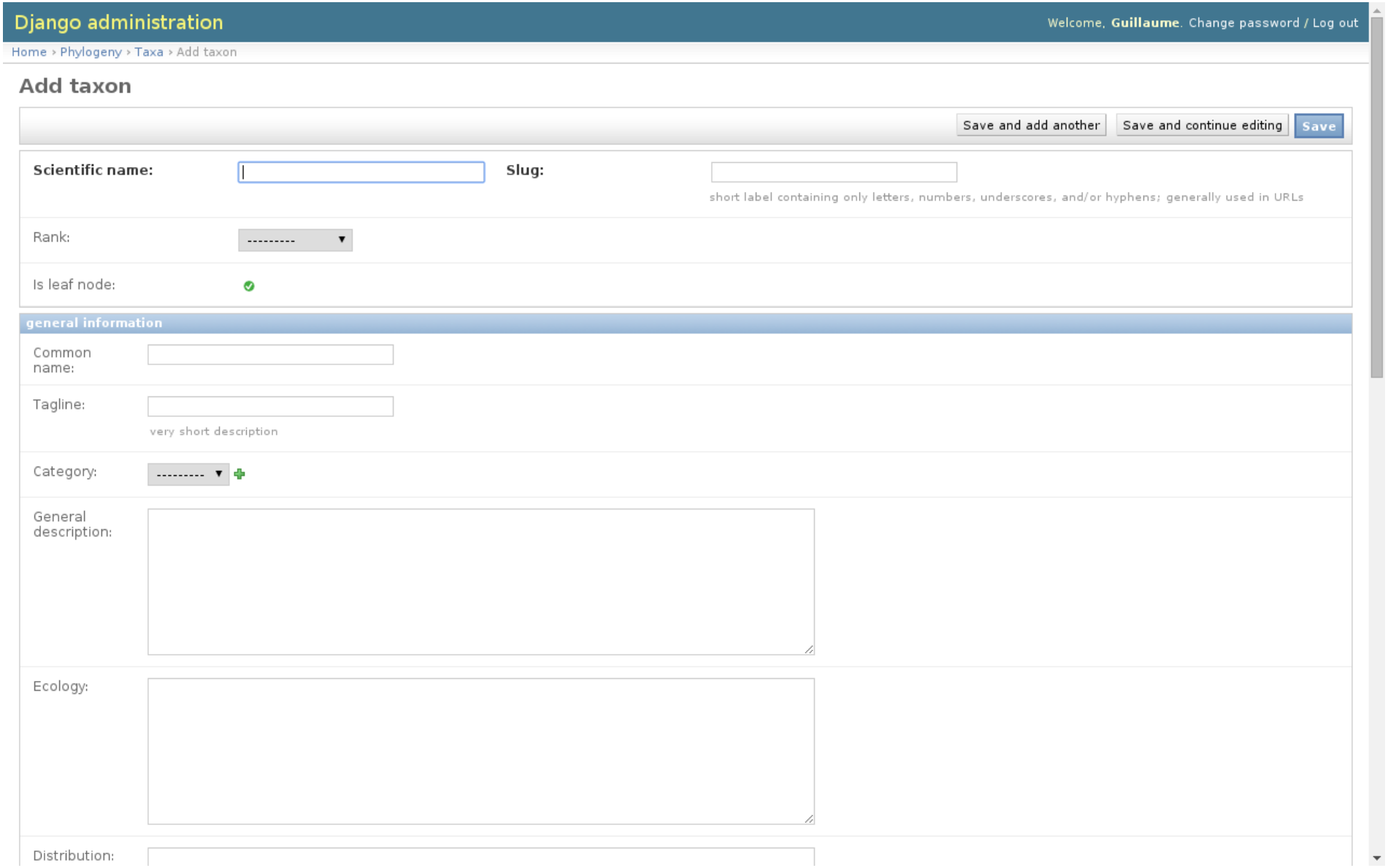

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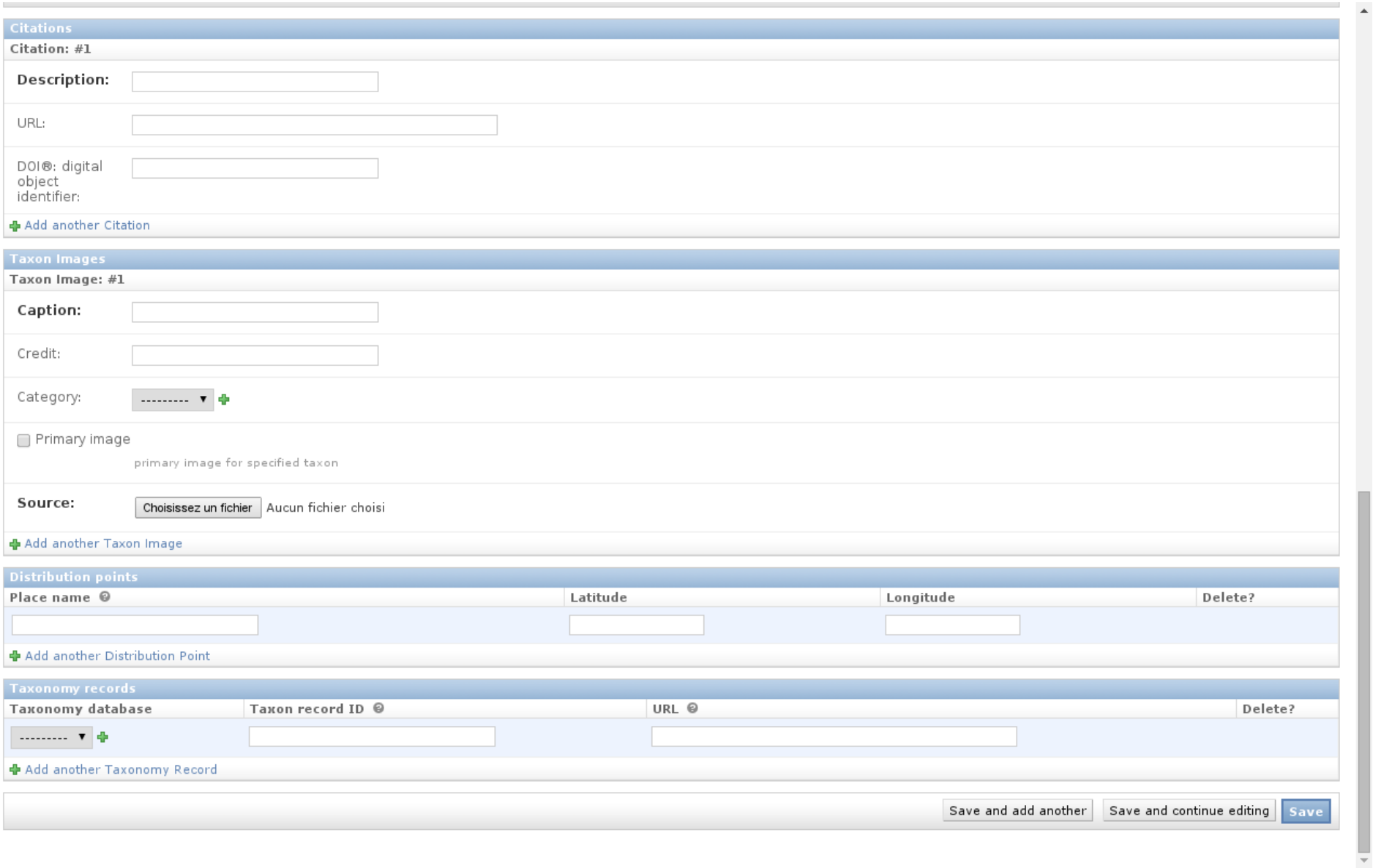

The DIADEMS project

- DIADEMS : Description, Indexation, Access to Sound and Ethnomusicological Documents
- Granted by ANR : french national research agency (ANR-12-CORD-0022)
- 3 years, 8 partners, 850 k€
- Apply and test MIR algorithms on large scale ethnomusicological data
- Define some high level interfaces to find new ways of explorations in large complex musical corpus
- New modes of collaboration between human science and computer science laboratories and researchers
- Define the vocabulary describing musical events in the usecase of ethnomusicilogy vs. signal processing
- http://www.irit.fr/recherches/SAMOVA/DIADEMS/fr/welcome/
- http://diadems.telemeta.org

DIADEMS - Partners

- Sponsors:
  - CNRS
  - Huma-Num (ex TGE Adonis)
  - ANR
  - CREM
  - UPMC
  - Parisson
- Partners :
  - IRIT (université Paul Sabatier, Toulouse 3)
  - LIMSI (universités Pierre et Marie Curie (UPMC, Paris 6) et Paris-Sud)
  - LAM (institut Jean Le Rond d'Alembert, UPMC)
  - LABRI (université de Bordeaux)
  - CREM (université Paris Ouest Nanterre La Défense)
  - LESC (université Paris Ouest Nanterre La Défense)
  - Museum d'Histoire Naturelle de Paris
  - Musée du Quai Branly

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4 Development

Development board

Links

- http://telemeta.org
- https://github.com/yomguy/Telemeta/
- https://github.com/yomguy/TimeSide/
- https://github.com/Parisson/Telemeta-doc/

Team

- Guillaume Pellerin
- Thomas Fillon
- Paul Brossier
- Riccardo Zaccarelli
- Maxime Lecoz
- David Doukan

Development - Lessons

Lessons from a 7 year old project

- Simplicity is better than complexity (KISS)
- Modularity is only accessible with a flexible language (thanks Python!)
- Models and Objects are more important than Technologies
- A good workflow is defined by the users themselves through feedback and constant revisions
- Prototyping is a crucial part of the development process
- A good platform relies on standards, not on formats
- The Open Source ecosystem gives some **tremendous** possibilities to develop, deploy and scale any platform project

Development - TODO list

Telemeta

- Update code to support Django new Class based views
- Rewrite geolocation services
- Public and enhanced user playlists
- Smart breadcrumbs
- Better interactions with TimeSide
- Enhance user interface (full HTML 5 + web audio API)
  - For annotations and segmentations in a collaborative manner
  - Provide import capabilities and feedback loop between manual and automatic annotations
  - Fancy displays of automatic analysis results (zoomable + synchronized with audio)
  - Add a User interface to control and tune the analysis parameters
- More documentation
- http://telemeta.org/report/1

Development - TODO list

TimeSide

- Tiny web server based on Django (done)
- Process task manager (done)
- Full HTML5 zooming player (+ annotations, segmentations, etc..)
- Analyzer parameters (+ interface)
- Improve Vamp plugins support (Vamp python host ?)
- Add more automatic segmentation and classification tools to support various semantic ontologies (cf. thesaurus)
- Add more music analysis tools to support Ethnomusicological research
- Add automatic similarity analysis tools (inside a song or between sound items)
- Enhance analysis result displays to send to Telemeta
- https://github.com/yomguy/TimeSide/issues

Development - TODO list

SABIOD

- Automatic synchronization from hardware audio source
- Add bioacoustic detection models to TimeSide (bats, dolphins, whales, etc...)
- Add various bio taxonomies to Telemeta
- Extend audio sampling frequencies

The End

Thank you!
We are looking for new collaborations
in ecology and bioacoustic fields. Let's keep in touch!

Links

- telemeta.org
- @telemeta

Contact me

- guillaume@parisson.com
- @yomguy
- github.com/yomguy/
- +GuillaumePellerin
- fr.linkedin.com/in/guillaumepellerin

TimeSide - Github repository

https://github.com/yomguy/TimeSide/

- 3 main branches: master, dev, diadems

Installation

https://github.com/yomguy/TimeSide#install

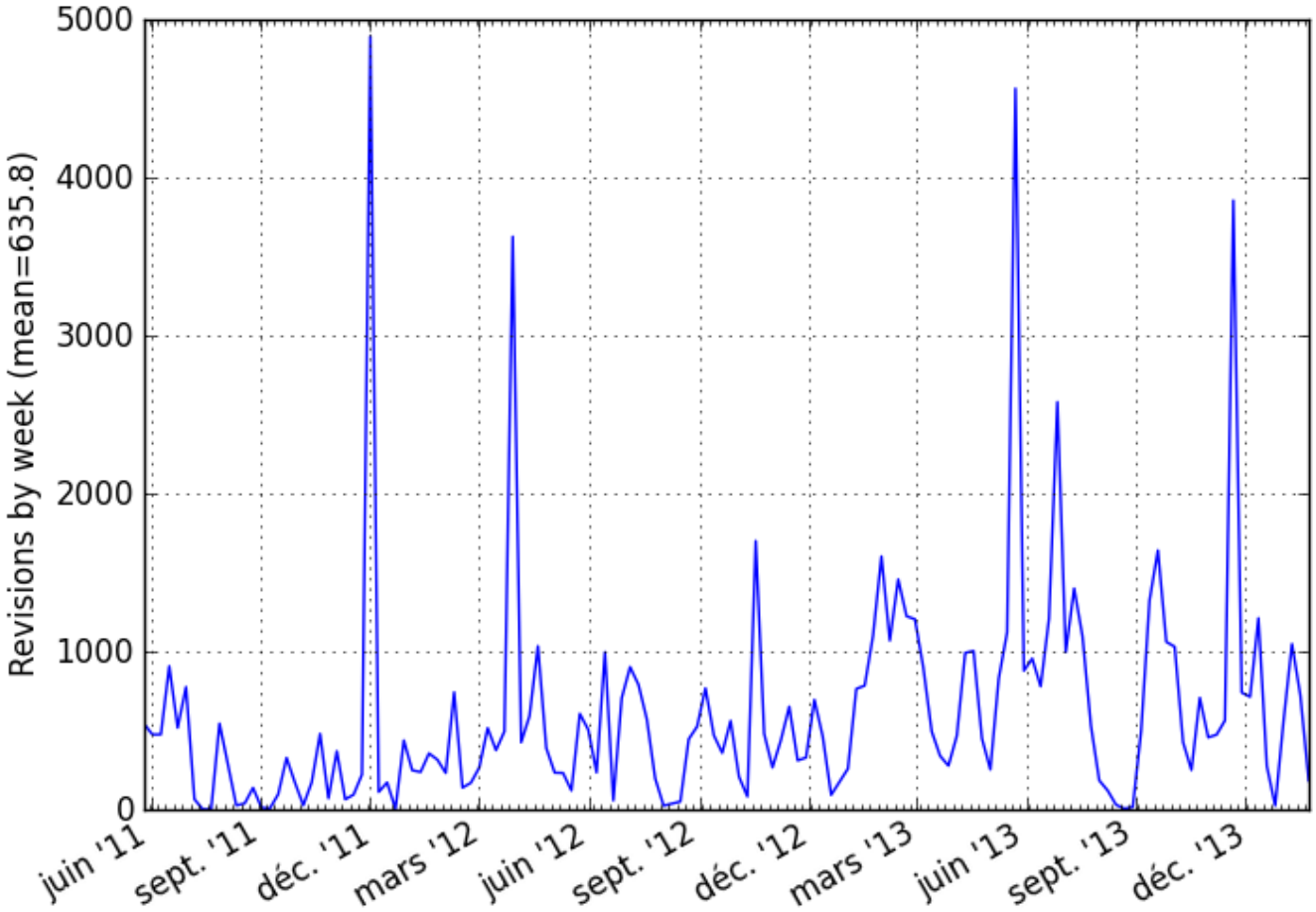
- Installation des dépendances :

```
$ echo "deb http://debian.parisson.com/debian/ stable main" |
$ sudo tee -a /etc/apt/sources.list
$ echo "deb-src http://debian.parisson.com/debian/ stable main" | sudo tee -a /etc/apt/sources.list
$ sudo apt-get update
$ sudo apt-get install git
$ sudo apt-get build-dep python-timeside
```

- Installation depuis le dépôt *Github* :

```
$ git clone https://github.com/yomguy/TimeSide.git
$ cd TimeSide
$ git checkout dev
$ export PYTHONPATH=$PYTHONPATH:`pwd`
$ python tests/run_all_tests
```

Statistics - CREM revisions



CREM's Telemeta platform

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- 2011 - 2014: collaborative indexing, more development, massive data imports...

Workflow

Example: CREM audio archive access rules vs. resource status

Collection status	Item status	Priority	Sliding date	Admin & Doc access	Member access	Public access
full	full	Collection	x	full	full	full
metadata	metadata		x	full	full	metadata
metadata	metadata			full	metadata	metadata
none	none		x	full	none	none
none	none			full	none	none
mixed	full	Item	x	full	full	full
	metadata		x	full	full	metadata
	metadata			full	metadata	metadata
	none		x	full	none	none
	none			full	none	none