Audition Télécom Paris

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Resume

Hédi HADIJI, born 25/01/1993 in Amiens, Picardie

- *2010-2012* Prépa (MPInfo) → Ecole Polytechnique
- *2015-2016* Masters Cambridge (Analysis…)
- *2016-2017* M2 Probas-Stats at Orsay
- *2017-2020* Ph.D. at Orsay (**Gilles Stoltz** and **Pascal Massart**)
  - Multi-Armed Bandits
- *2020-2022* Postdoc at the Univ. of Amsterdam (**Tim van Erven**)
  - Online Learning

Research

Adaptive Sequential Decision-Making

Study tasks in which a learner repeatedly makes decisions based on data coming in sequentially

Mathematical research… but ultimate goal is to contribute to practice

→ Need for **Adaptivity:**
Designing practical algorithms needing little manual tuning

What assumptions on the data?

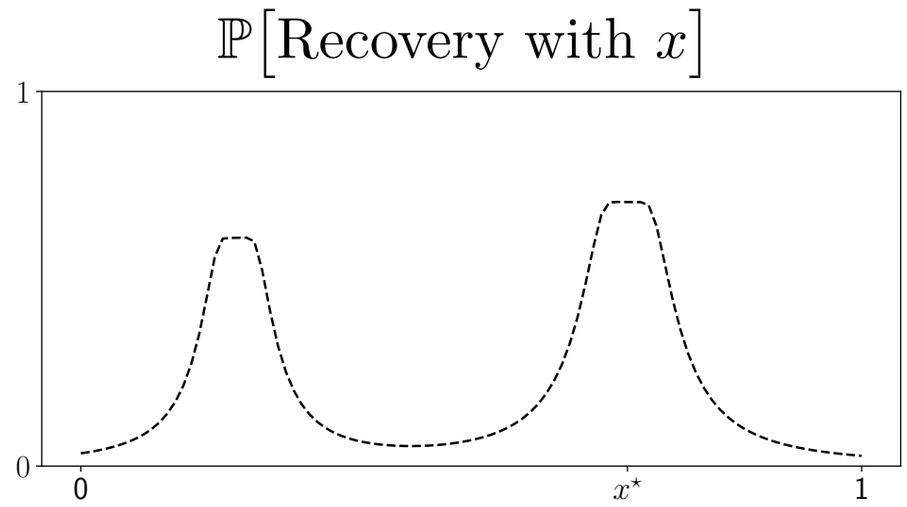
How much does the learner need to know about the data generating process to perform well?

Bandits (PhD)

Example: Continuous Bandits

Protocol: Continuous Clinical Trials

1: **for** $t = 1, \ldots, T$
2: New patient comes in
3: Doctor chooses drug dosage $x_t \in [0, 1]$
4: Observes recovery of patient



Goal: Cure as many patients as possible

Toy model of fundamental and ubiquitous problem:
trading off between exploration and exploitation

What it the learner does not know
the smoothness of the recovery probability?

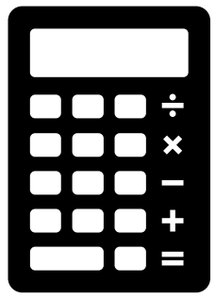
Publications: JMLR(2), Neurips, 1 preprint

Online Learning (Postdoc)

Example: Online Supervised Learning

Given dataset $\{(x_t, y_t)\}$

Predict the label of new feature x_{t+1}



No retraining the whole model from scratch when new data comes in

Under appropriate assumptions, performance guarantees
even when the data is not iid… but these are pessimistic

What if the data is “close to i.i.d.”?

Publications: ALT, COLT, Neurips(?), ++

Future @ Télécom

Roadmap: Short to Mid Term Goals

- Maintain scientific connections and develop new ones
- Continue to learn: Reinforcement Learning
- Develop practical/industrial connections
- Supervising students

The S^2A team is the perfect environment to achieve these goals

especially within the themes
‘Apprentissage statistique’ and ‘Probabilités et Statistiques’

Teaching

Teaching Experience

- IUT de Gestion de Sceaux
- ‘Statistiques pour les biologies’ L2 de Biologie à Orsay
- ‘Statistiques’ en M1 Ensta/Orsay
- ‘Machine Learning Theory’ at the Dutch National Mastermath

Diverse backgrounds and levels of motivations
→ various teaching challenges

Relevant Skills

Skills

- Experience teaching
- Broad mathematical background
- Comfortable coding in python (and R)
- Knowledge of the French system and international students

Philosophy

- Help the students be active in their learning
- Manage confidence and motivation

Classes I Could Teach

Undergrad

- 1ère année: Analyse, Probabilités et statistiques
- 2e année: Filières sciences des données, Traitement du signal pour l'intelligence artificielle Mathématiques, Informatique théorique et recherche opérationnelle

Mastères spécialisés:

- IA: (Statistique, Modèles Probabilistes et Apprentissage Automatique, Fondements de l'apprentissage statistique, Apprentissage profond, Apprentissage par renforcement
- Big Data: Statistiques, Machine Learning

Projects are a great way to learn!

Thank you!