



# EFFICIENT STREAM DATA MANAGEMENT : FROM BIG DATA TO FAST DATA

---

le 14 mars 2019 14h00

ENS Rennes, Salle du conseil

**Soutenance d'Habilitation à Diriger des Recherches de Alexandru Costan**  
**Spécialité Informatique**



This manuscript provides a synthetic overview of my research journey since my PhD defense. The document does not claim to present my work in its entirety, but focuses on the contributions to data management in support of stream processing. These results address all stages of the stream processing pipeline: data collection and in-transit processing at the edge, transfer towards the cloud processing sites, ingestion and persistent storage.

I start by presenting the general context of stream data management in light of the recent transition from Big to Fast Data. After highlighting the challenges at the data level associated with batch and real-time analytics, I introduce a subjective overview of my proposals to address them. They bring solutions to the problems of in-transit stream storage and processing, fast data transfers, distributed metadata management, dynamic ingestion and transactional storage. The integration of these solutions into functional prototypes and the results of the large-scale experimental evaluations on clusters, clouds and supercomputers demonstrate their effectiveness for several real-life applications ranging from neuro-science to LHC nuclear physics. Finally, these contributions are put into the perspective of the High Performance Computing - Big Data convergence.

---

## THÉMATIQUE(S)

Recherche - Valorisation, Vie des personnels, Vie de l'École

---

Mise à jour le 12 mars 2019

[Séminaires 2020-2021](#)  
[Séminaires 2019-2020](#)  
[Séminaires 2018-2019](#)  
[Séminaires 2017-2018](#)  
[Séminaires 2016-2017](#)  
[Séminaires 2015-2016](#)  
[Séminaires 2014-2015](#)  
[Séminaires 2013-2014](#)  
[Séminaires 2012-2013](#)  
[Séminaires 2011-2012](#)  
[Séminaires 2010-2011](#)  
[Séminaires 2009-2010](#)  
[Séminaires 2008-2009](#)  
[Séminaires 2007-2008](#)  
[Séminaires 2006-2007](#)  
[Séminaires 2005-2006](#)  
[Séminaires 2004-2005](#)  
[Séminaires 2003-2004](#)  
[Séminaires 2002-2003](#)