

## **Atomic Appends: Selling Cars and Coordinating Armies with Multiple Blockchains**

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Facultad de Informática  
Sala de Grados - jueves 21 de noviembre de 2019 - 14:30  
*Entrada libre hasta completar el aforo*

### **Resumen:**

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In this work we examine the fundamental problem of interoperable and interconnected blockchains. In particular, we begin by introducing the Multi-Distributed Ledger Objects (MDLO), which is the result of aggregating multiple Distributed Ledger Objects – DLO (a DLO is a formalization of the blockchain) and that supports append and get operations of records (e.g., transactions) in them from multiple clients concurrently. Next we define the AtomicAppends problem, which emerges when the exchange of digital assets between multiple clients may involve appending records in more than one DLO. We examine the solvability of this problem assuming rational and risk averse clients that may fail by crashing, and under different client utility and append models, timing models, and client failure scenarios. We show that for some cases the existence of an intermediary is necessary for the problem solution. We propose the implementation of such intermediary over a specialized blockchain, we term Smart DLO (SDLO), and we show how this can be used to solve the AtomicAppends problem even in an asynchronous, client competitive environment, where all the clients may crash.

### **Sobre Antonio Fernández Anta:**

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Dr. Antonio Fernández Anta is a Research Professor at IMDEA Networks. Previously he was a Full Professor at the Universidad Rey Juan Carlos (URJC) and was on the Faculty of the Universidad Politécnica de Madrid (UPM), where he received an award for his research productivity. He was a postdoc at MIT from 1995 to 1997, and spent sabbatical years at Bell Labs Murray Hill and MIT Media Lab. He has been awarded the Premio Nacional de Informática "Aritmel" in 2019 and is a Mercator Fellow of the SFB MAKI in Germany since 2018. He has more than 25 years of research experience, and more than 200 scientific publications. He was the Chair of the Steering Committee of DISC and has served in the TPC of numerous conferences and workshops. He received his M.Sc. and Ph.D. from the University of SW Louisiana in 1992 and 1994, respectively. He completed his undergraduate studies at the UPM, having received awards at the university and national level for his academic performance. He is a Senior Member of ACM and IEEE.