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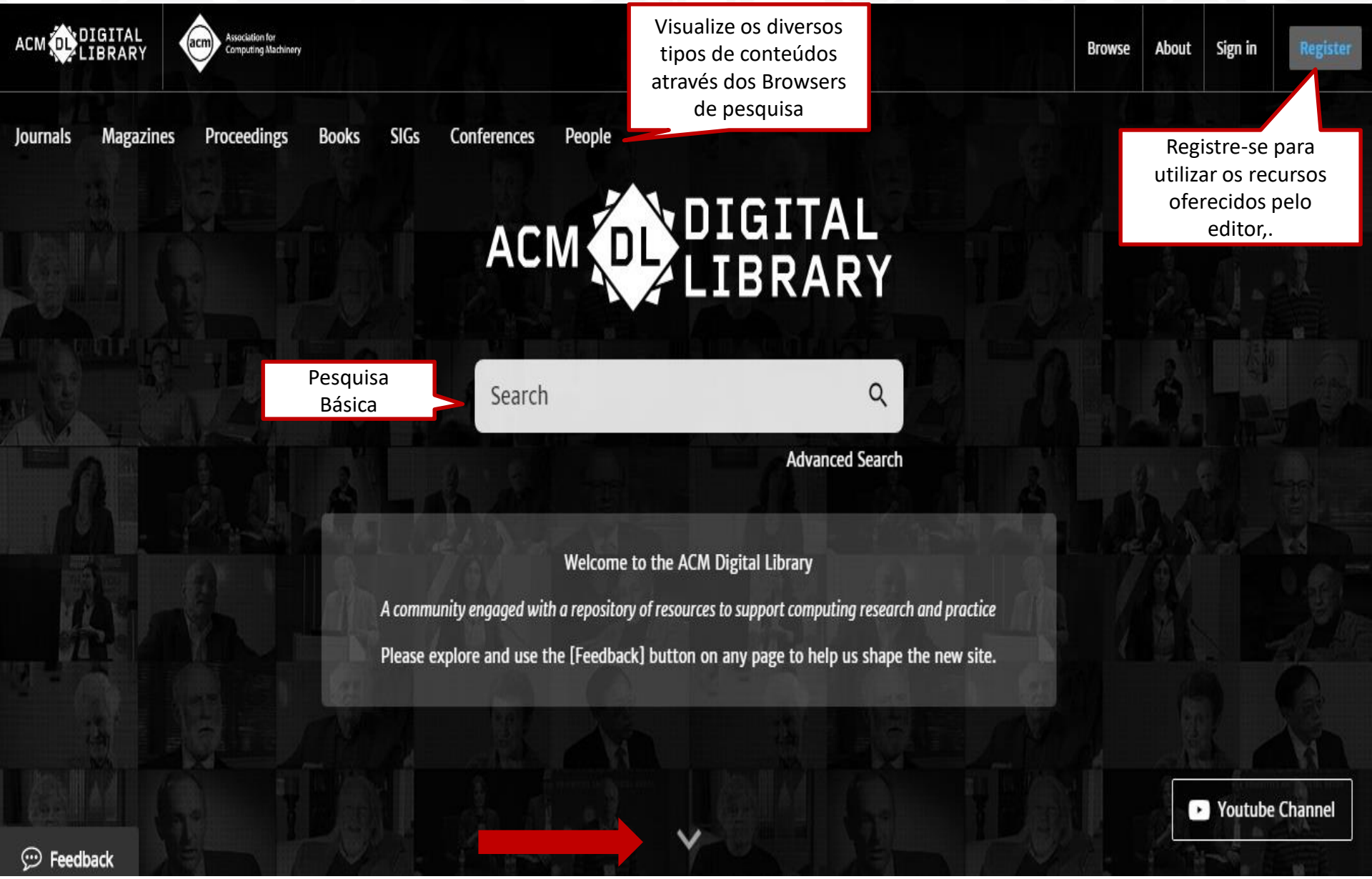

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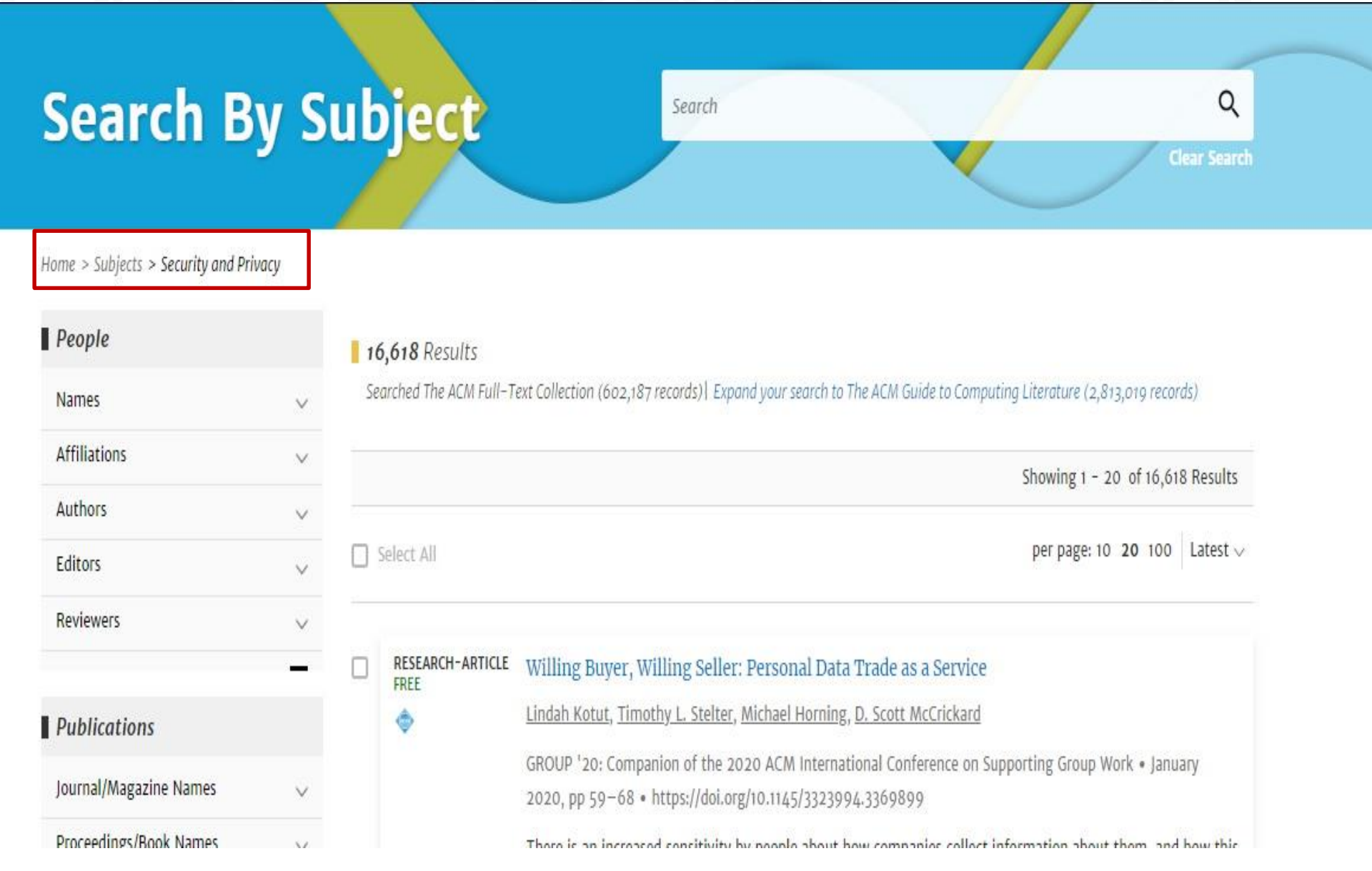

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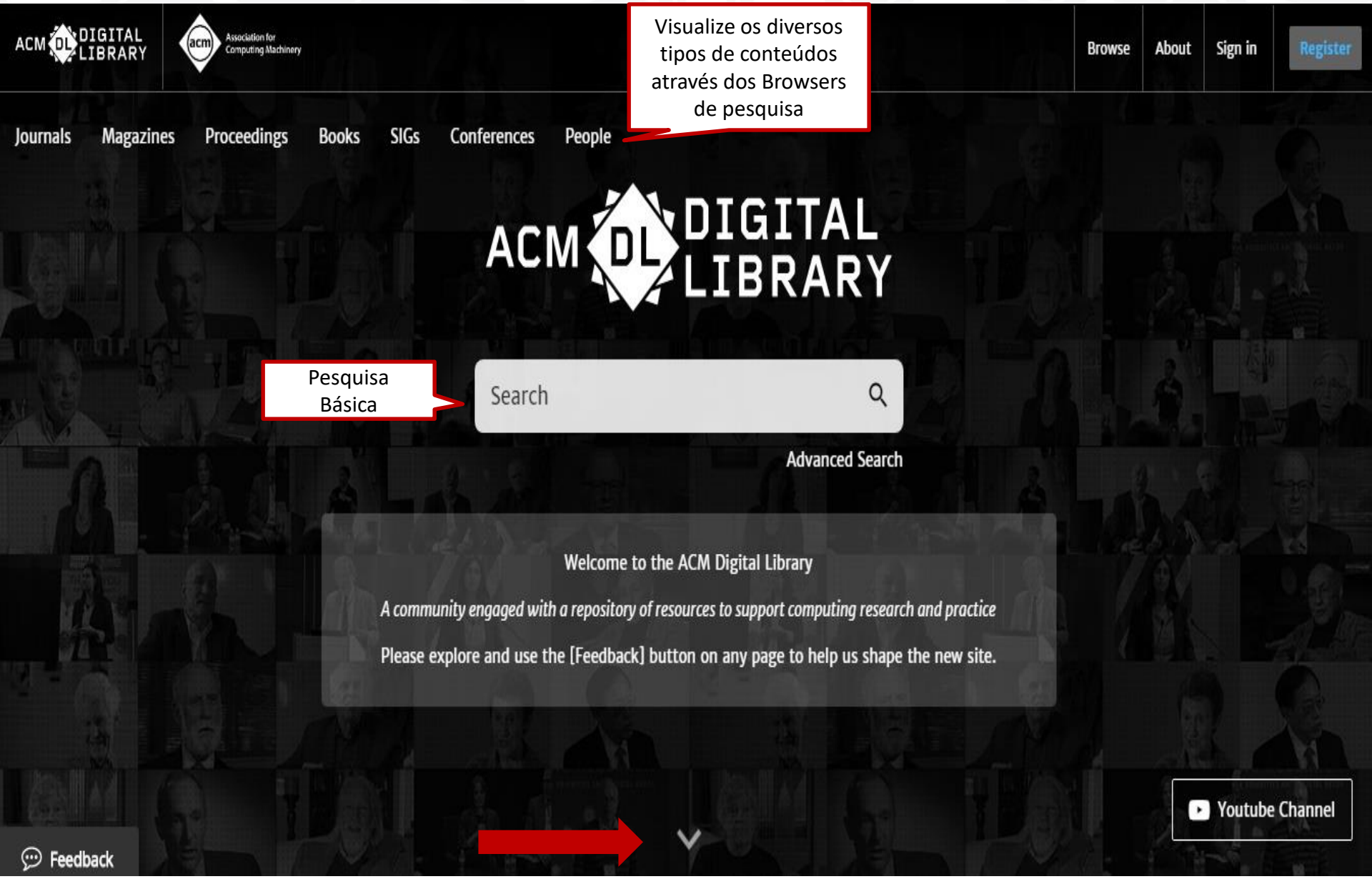

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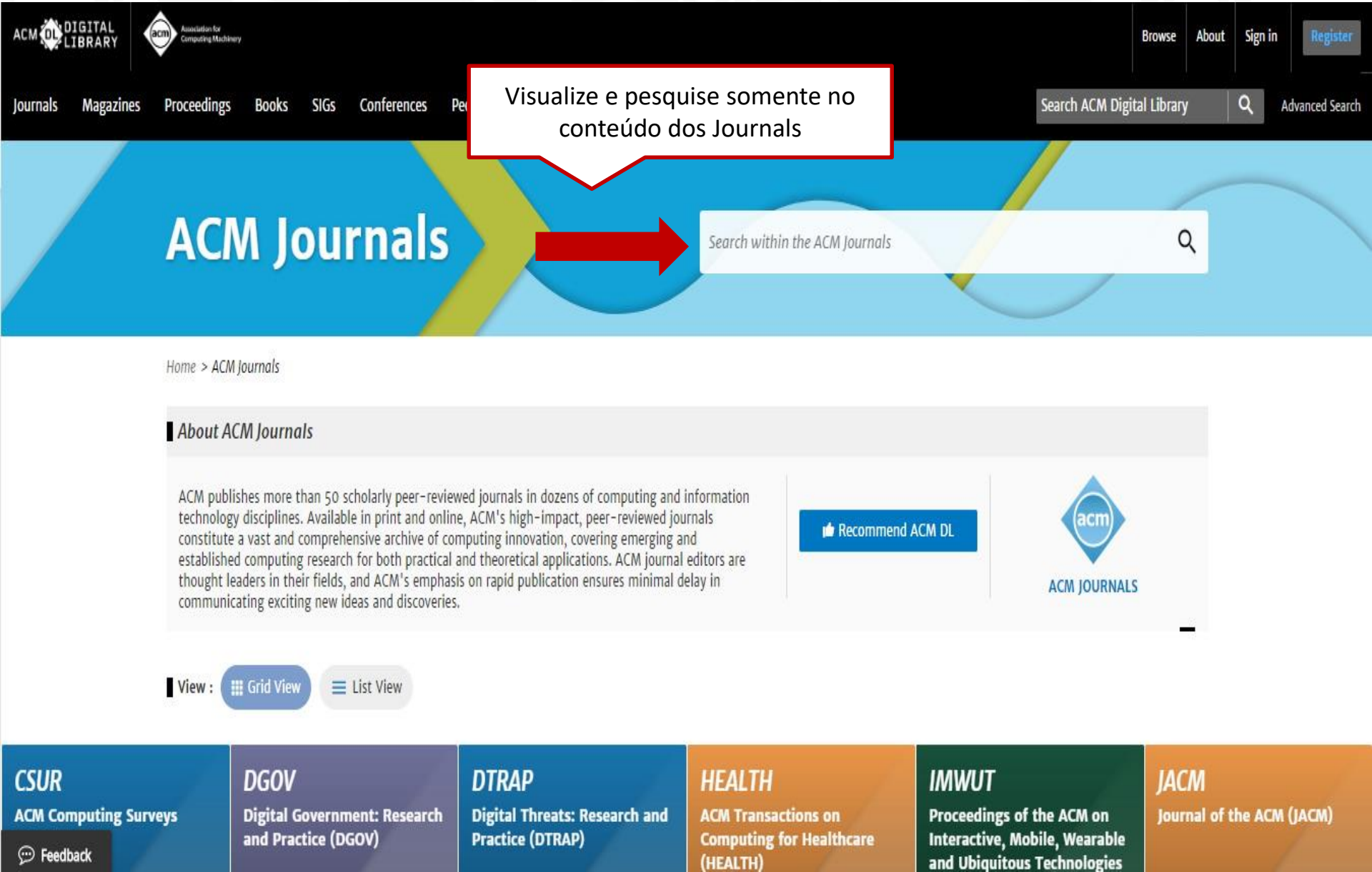

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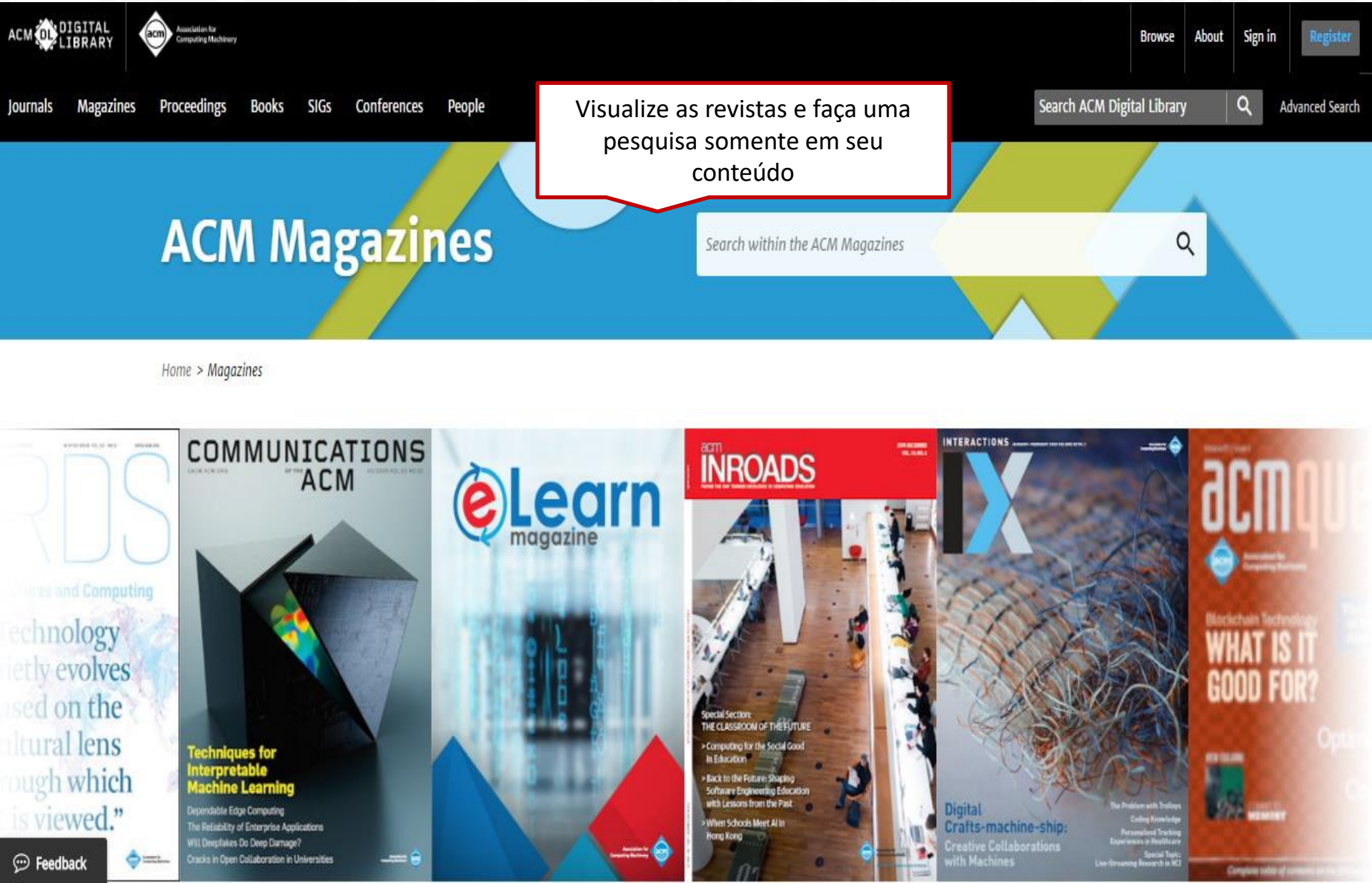

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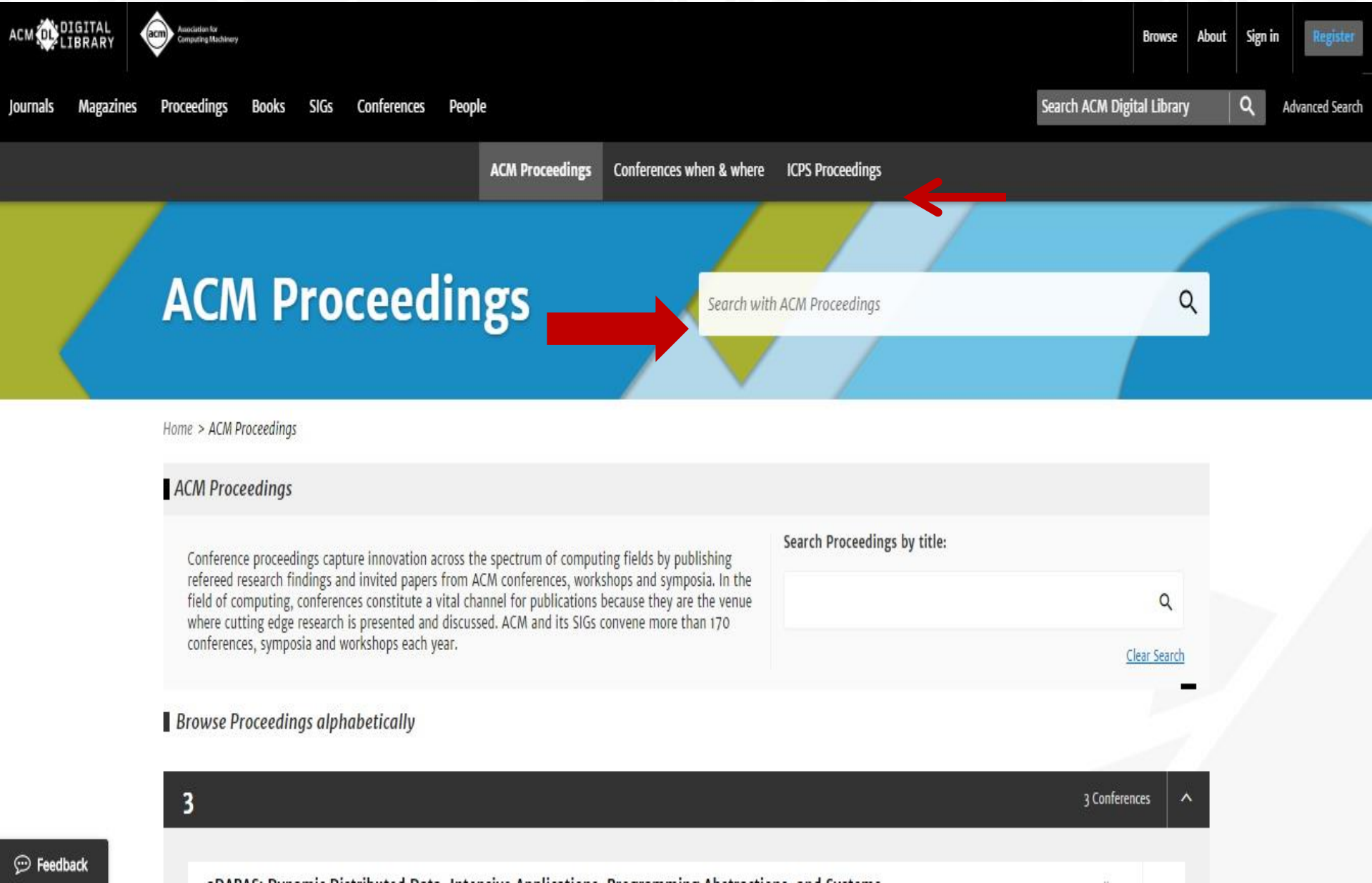

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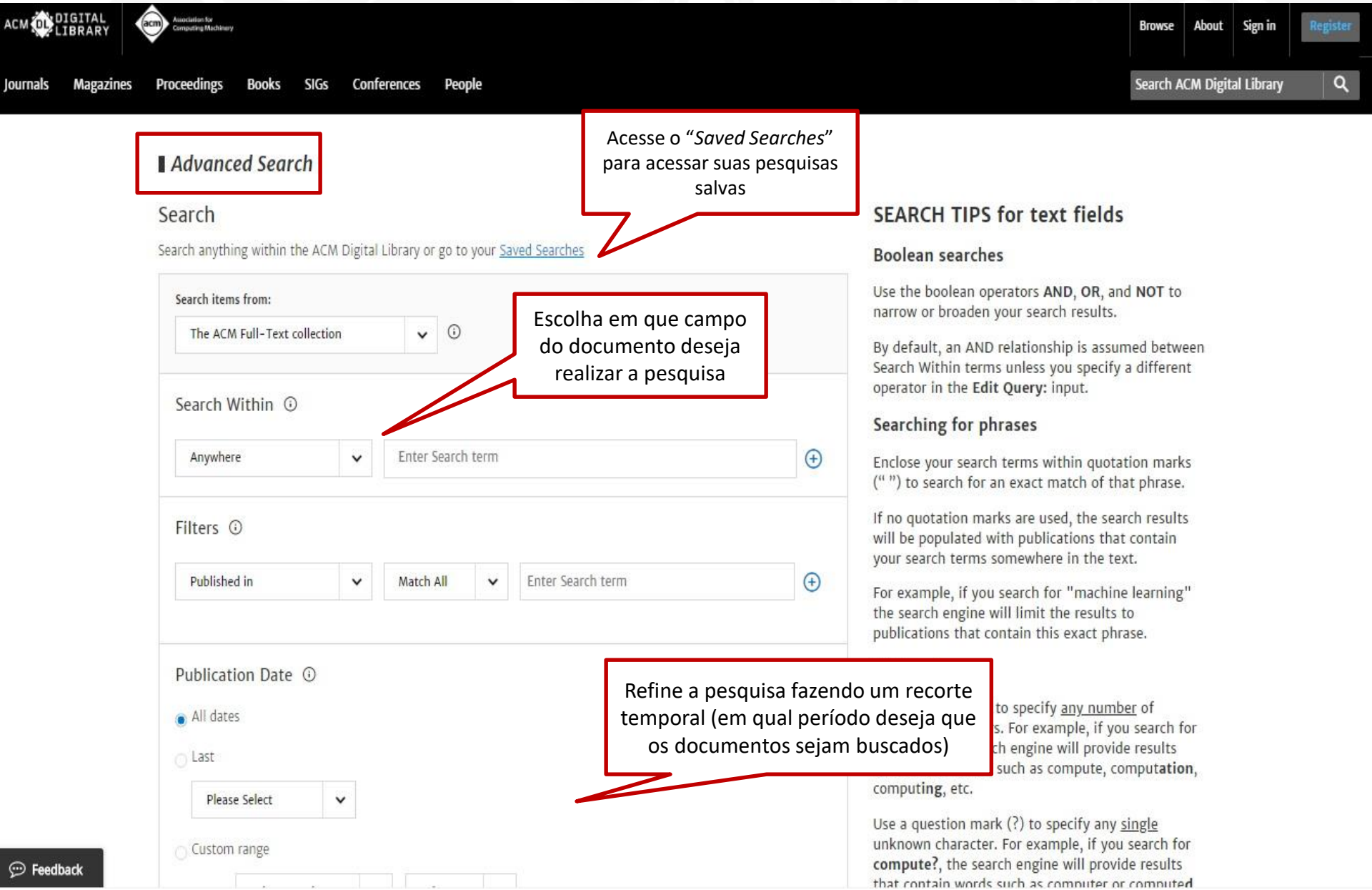

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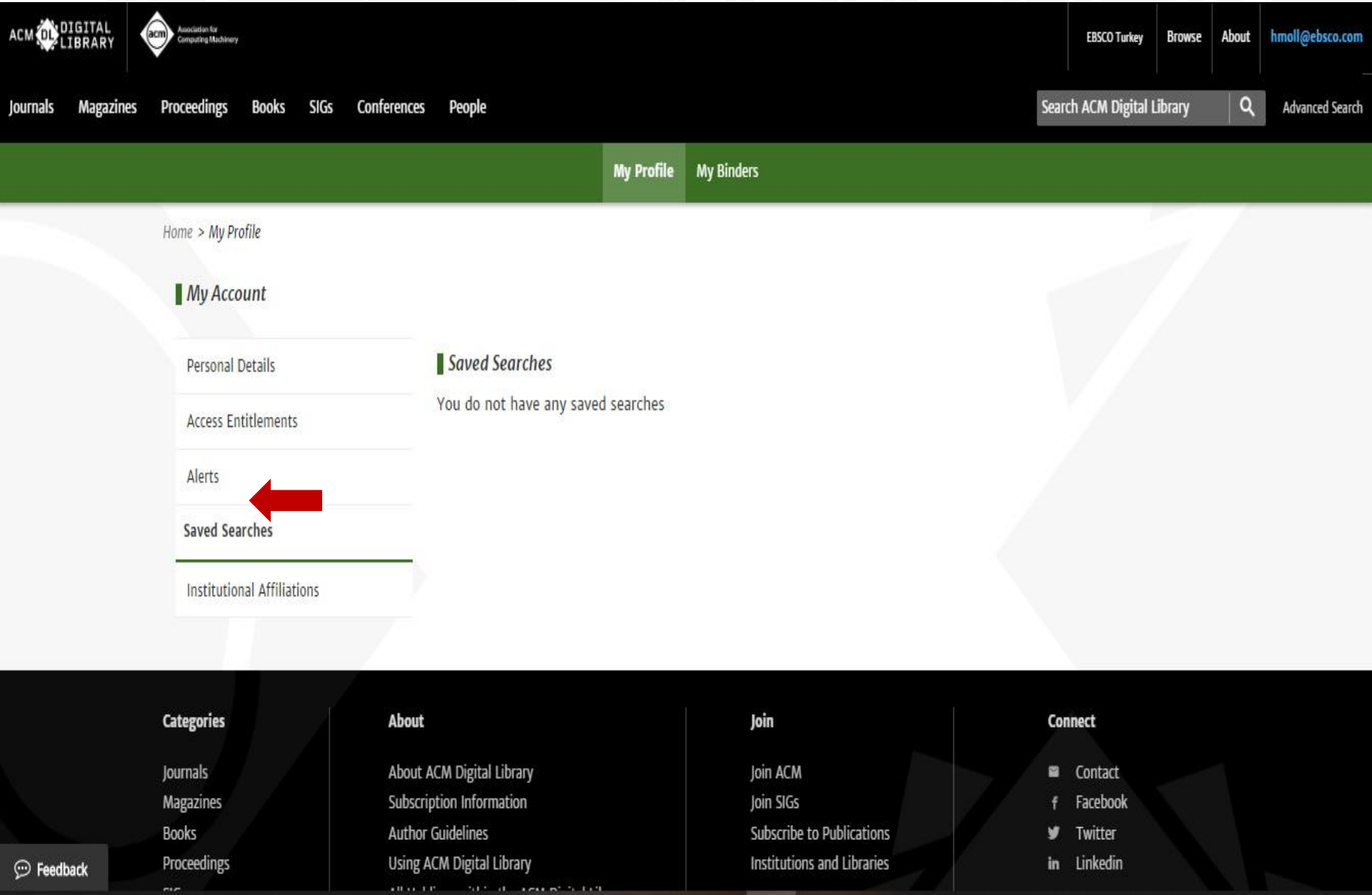

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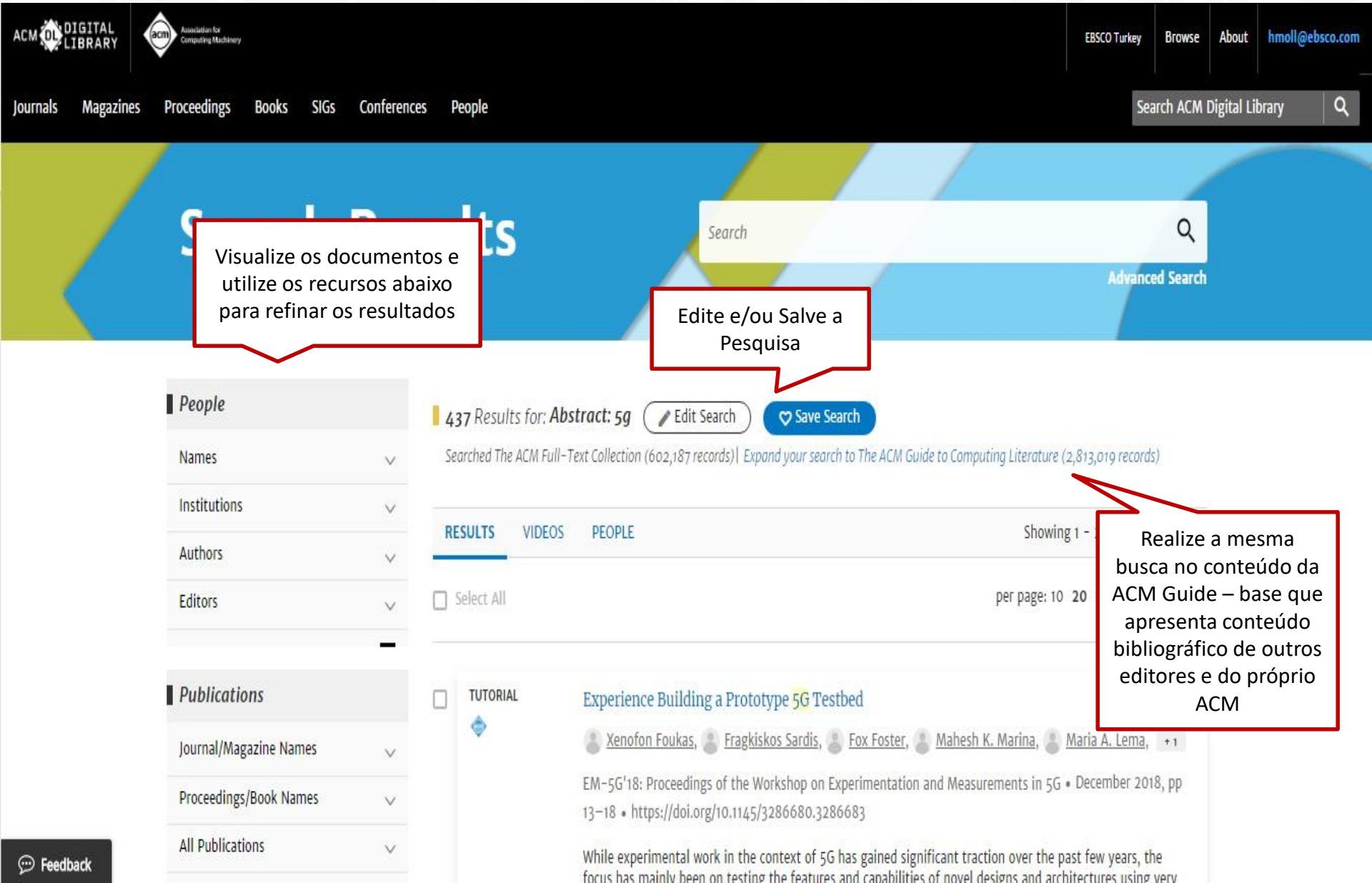

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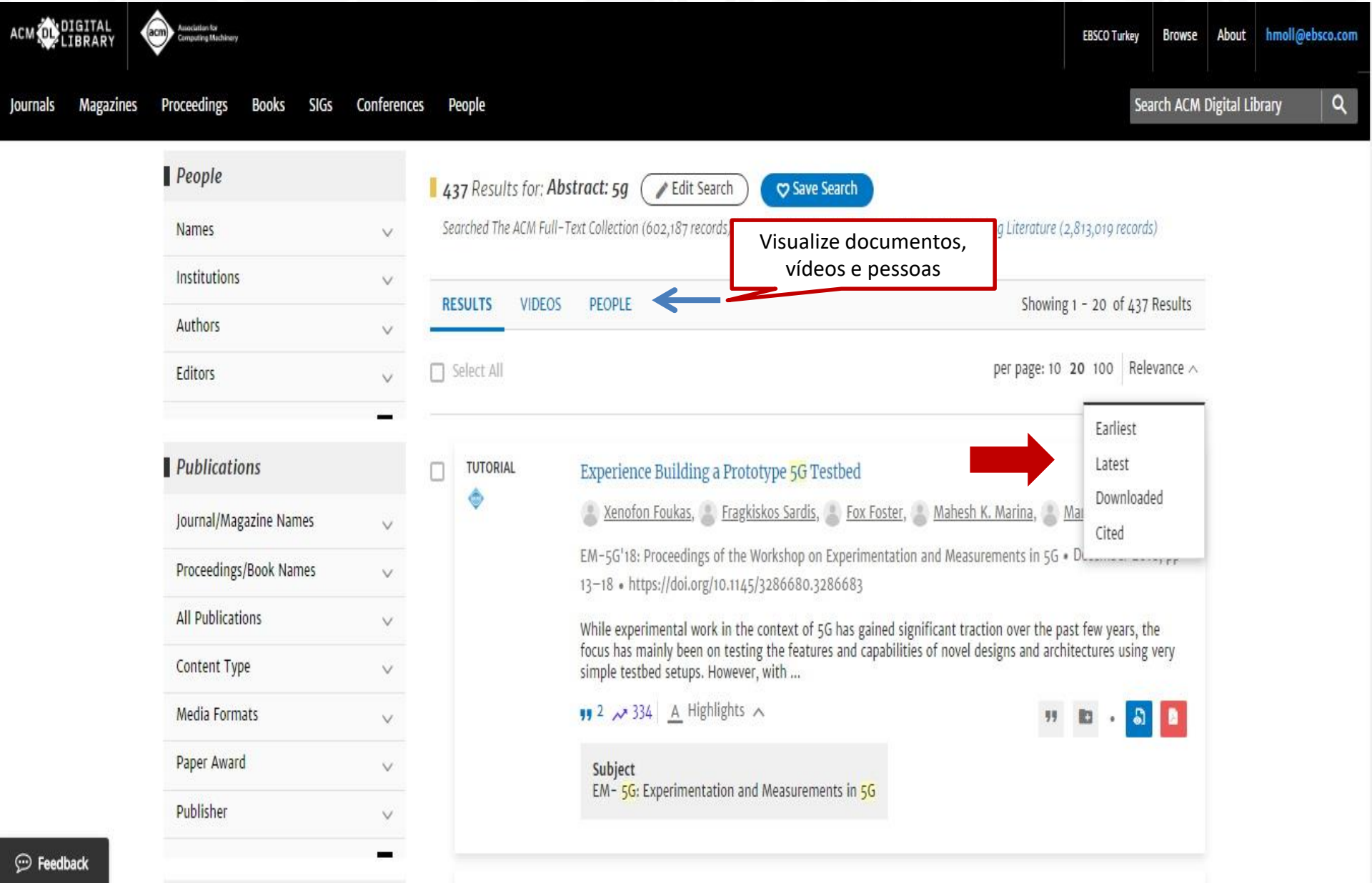

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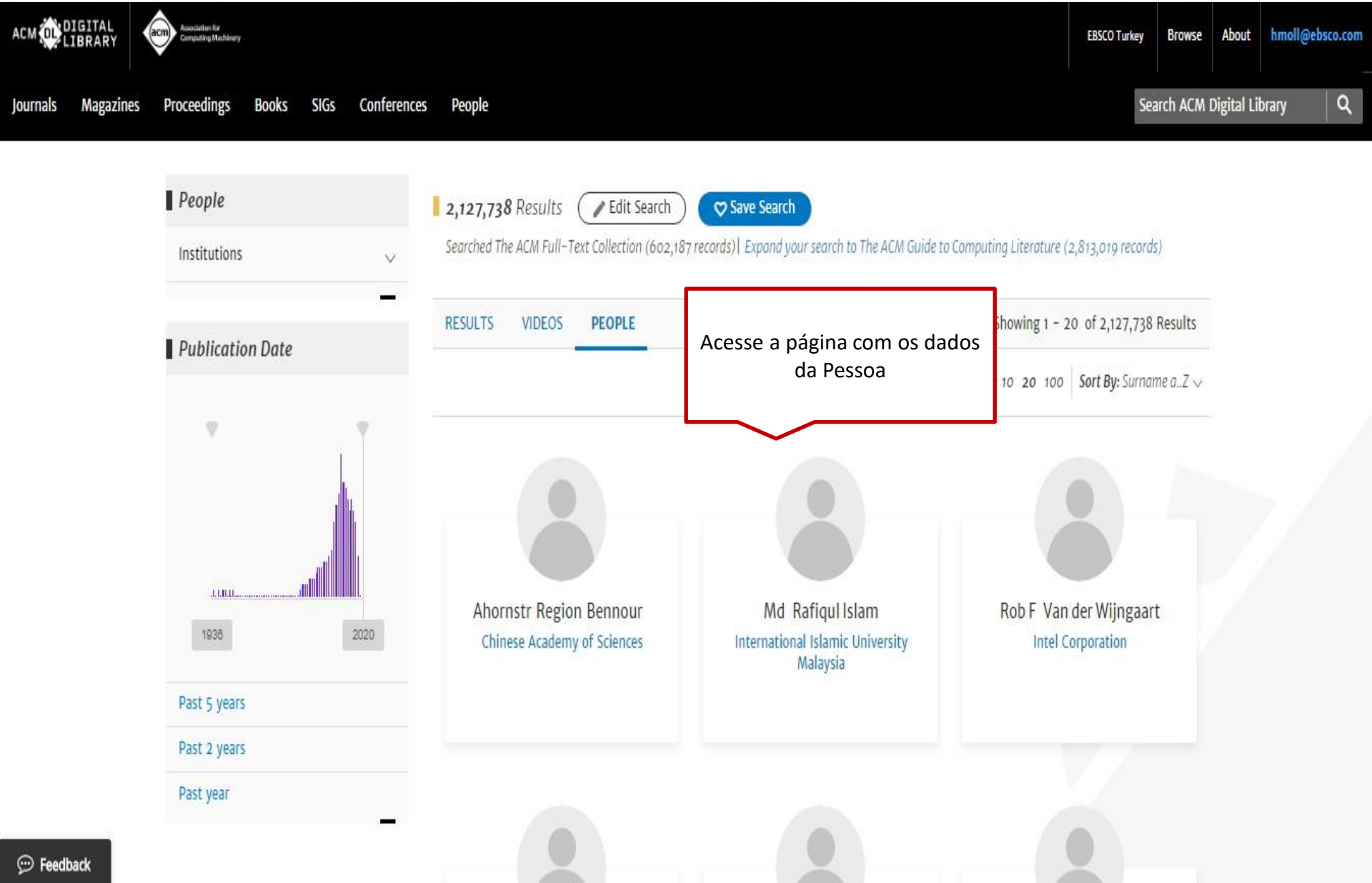

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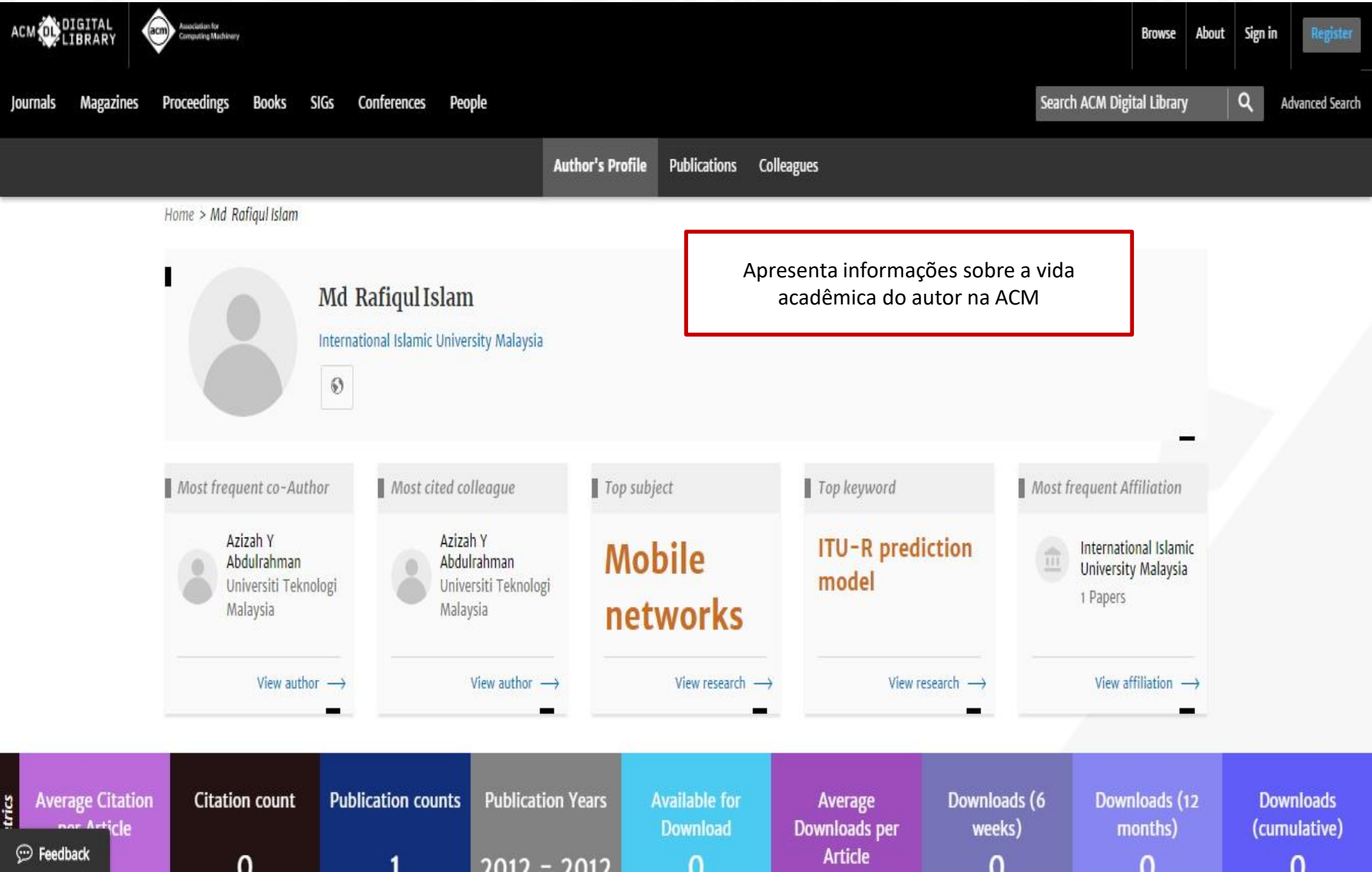

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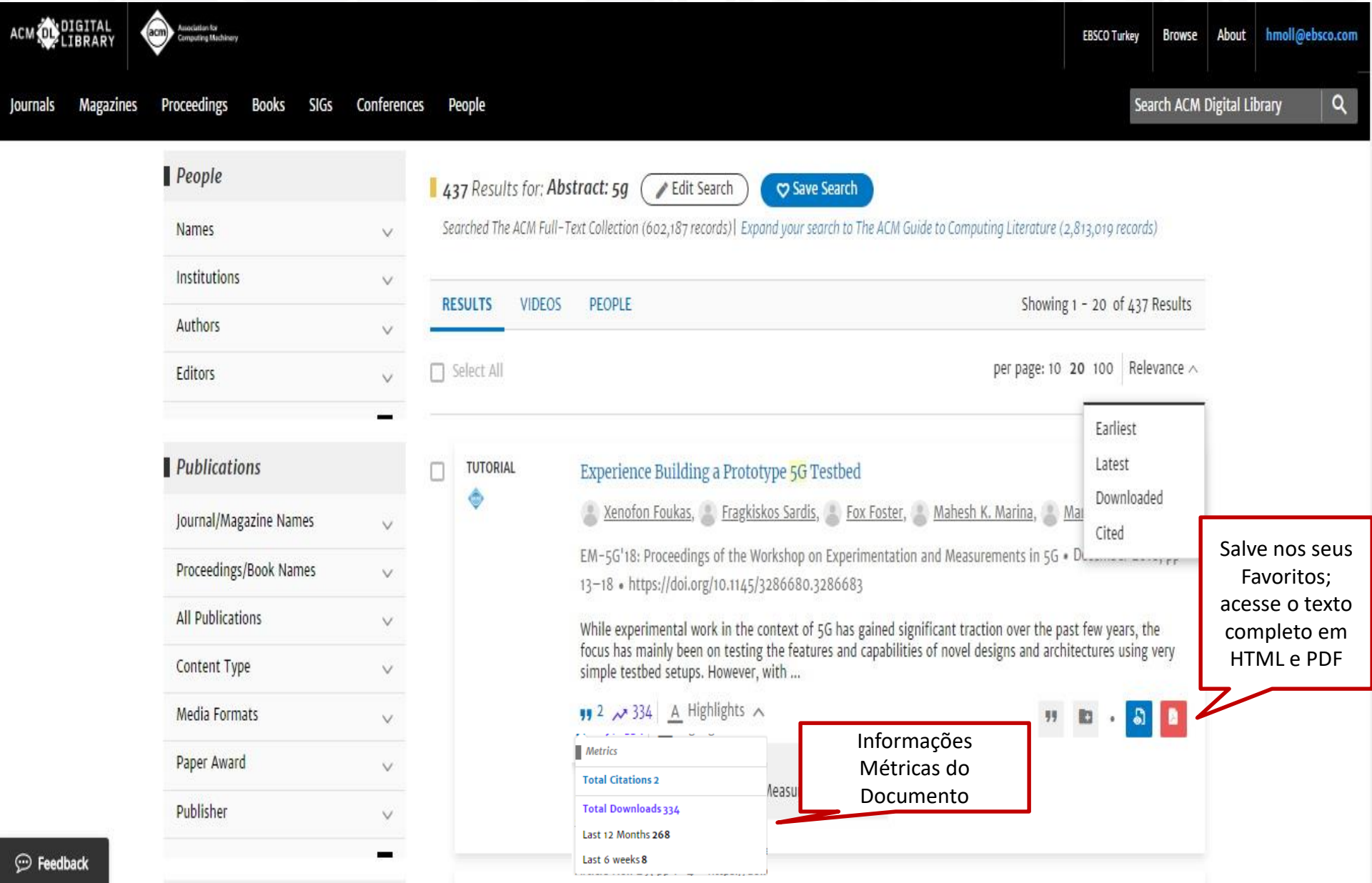

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TUTORIAL

Experience Building a Prototype 5G Testbed

Authors: Xenofon Foukas, Fragkiskos Sardis, Fox Foster, Mahesh K. Marina, Maria A. Lema, Mischa Dohler Authors Info & Affiliations

Publication: EM-5G'18: Proceedings of the Workshop on Experimentation and Measurements in 5G • December 2018 • Pages 13–18 • https://doi.org/10.1145/3286680.3286683

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ABSTRACT

While experimental work in the context of 5G has gained significant traction over the past few years, the focus has mainly been on testing the features and capabilities of novel designs and architectures using very simple testbed setups. However, with the emergence of network slicing as a key feature of 5G, creating larger scale infrastructures capable of supporting

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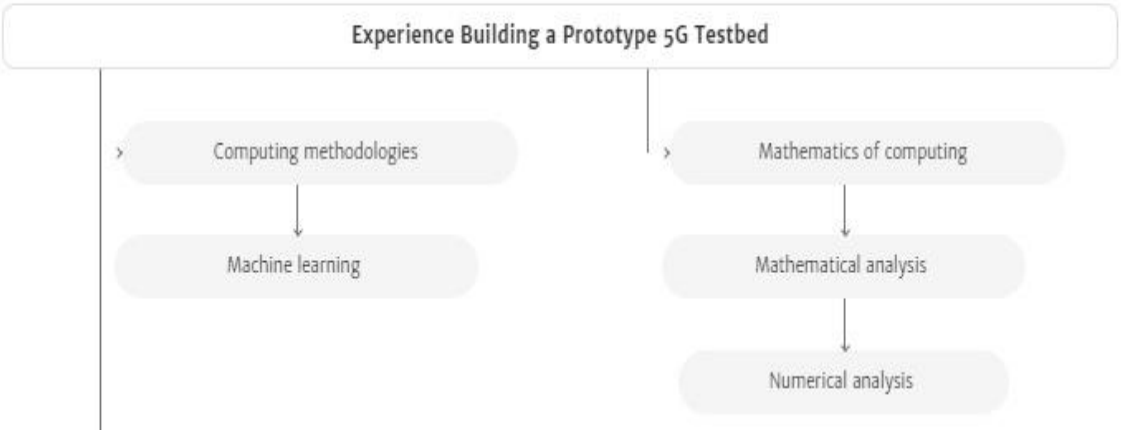

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ABSTRACT

While experimental work in the context of 5G has gained significant traction over the past few years, the focus has mainly been on testing the features and capabilities of novel designs and architectures using very simple testbed setups. However, with the emergence of network slicing as a key feature of 5G, creating larger scale infrastructures capable of supporting virtualized end-to-end mobile network services strictly on simulations. This change stems from a number of factors, including the appearance and widespread adoption of programmable Software-Defined Radios (SDRs) and the softwarization of the mobile network functions through various open source projects like OpenAirInterface (OAI) [12] and srsLTE [8]. This has made the low-cost deployment of mobile networks over commodity hardware a reality, allowing interested parties outside the telecommunications

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Experience Building a Prototype 5G Testbed

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ABSTRACT

While experimental work in the context of 5G has gained significant traction over the past few years, the focus has mainly been on testing the features and capabilities of novel designs and architectures using very simple testbed setups. However, with the emergence of network slicing as a key feature of 5G, creating larger scale infrastructures capable of supporting virtualized end-to-end mobile network services is of paramount importance for experimentation. In this work, we describe our experience in building such a prototype cross-domain testbed targeting 5G use cases, by enabling multi-tenancy through the virtualization of the underlying infrastructure. The capabilities of the testbed are demonstrated through the use case of neutral-host indoor small-cell deployments, followed by a discussion on the challenges we faced while building the testbed, which open up new research opportunities in this space.

CCS CONCEPTS

• **Networks** → **Wireless access points, base stations and infrastructure**; **Network experimentation**; **Mobile networks**;

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Until now, most research works in the 5G space that rely on prototype system implementations have focused on individual parts of the mobile network architecture (e.g. the RAN [5, 6] or the mobile core [11, 21]). Such systems are usually evaluated using simple small scale deployments comprised of a handful of commodity PCs. However, more recently there has been an increasing research interest towards the realization of more complex mobile network deployments that can support end-to-end multi-tenancy or *network slicing* in 5G parlance to study scenarios with multiple diverse services.

The key concept behind network slicing is the capability of virtualizing the underlying infrastructure and of creating logical networks

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