Universidad Nacional de Ingeniería

Maestría en Data Science:
Tesis 1: Desarrollo de plan de tesis

Revisión documentaria

Mg. Ing. Luis Alberto Sánchez Alvarado

Desarrollo de la perspectiva teórica

Implica fundamentar conceptualmente cómo se llevará a cabo el estudio una vez que se ha identificado el problema de investigación, guiando así la investigación y proporcionando una base sólida para su diseño y ejecución en el contexto de la ciencia de datos.

Cubre dos aspectos

Estado del arte

El estado del arte se refiere al nivel actual de desarrollo, las tecnologías disponibles y las tendencias relevantes para la problemática planteada en el ámbito de la ciencia de datos. Proporciona una visión clara de cómo se ha abordado previamente el problema en estudio, así como otros problemas similares. Se logra mediante una revisión documentaria, donde se identifica, consulta y analiza de artículos científicos pertinentes al tema de investigación.

Marco teórico

El marco teórico se centra en proporcionar un marco conceptual y teórico específico que orienta y fundamenta la investigación en ciencia de datos. Surge a partir de la revisión documentaria, donde se identifican y analizan conceptos, metodologías, teorías, algoritmos o modelos relevantes para el tema de investigación. Este marco no solo proporciona una base sólida para el diseño y desarrollo de la tesis, sino que también ayuda a contextualizar los hallazgos y resultados obtenidos durante el estudio.

¿Qué es la revisión documentaria?

La revisión documentaria se centra en la búsqueda, identificación, evaluación y síntesis crítica de la literatura existente relacionada con un tema de investigación específico

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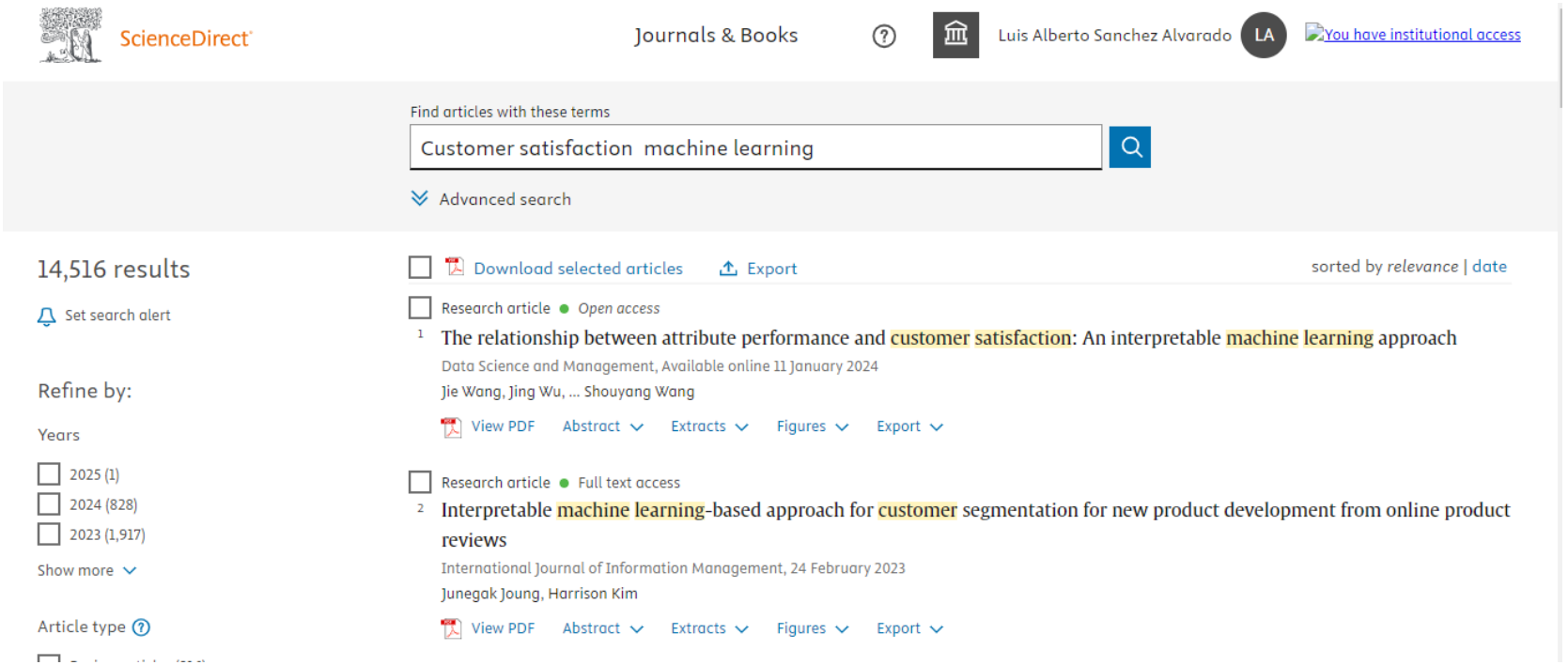

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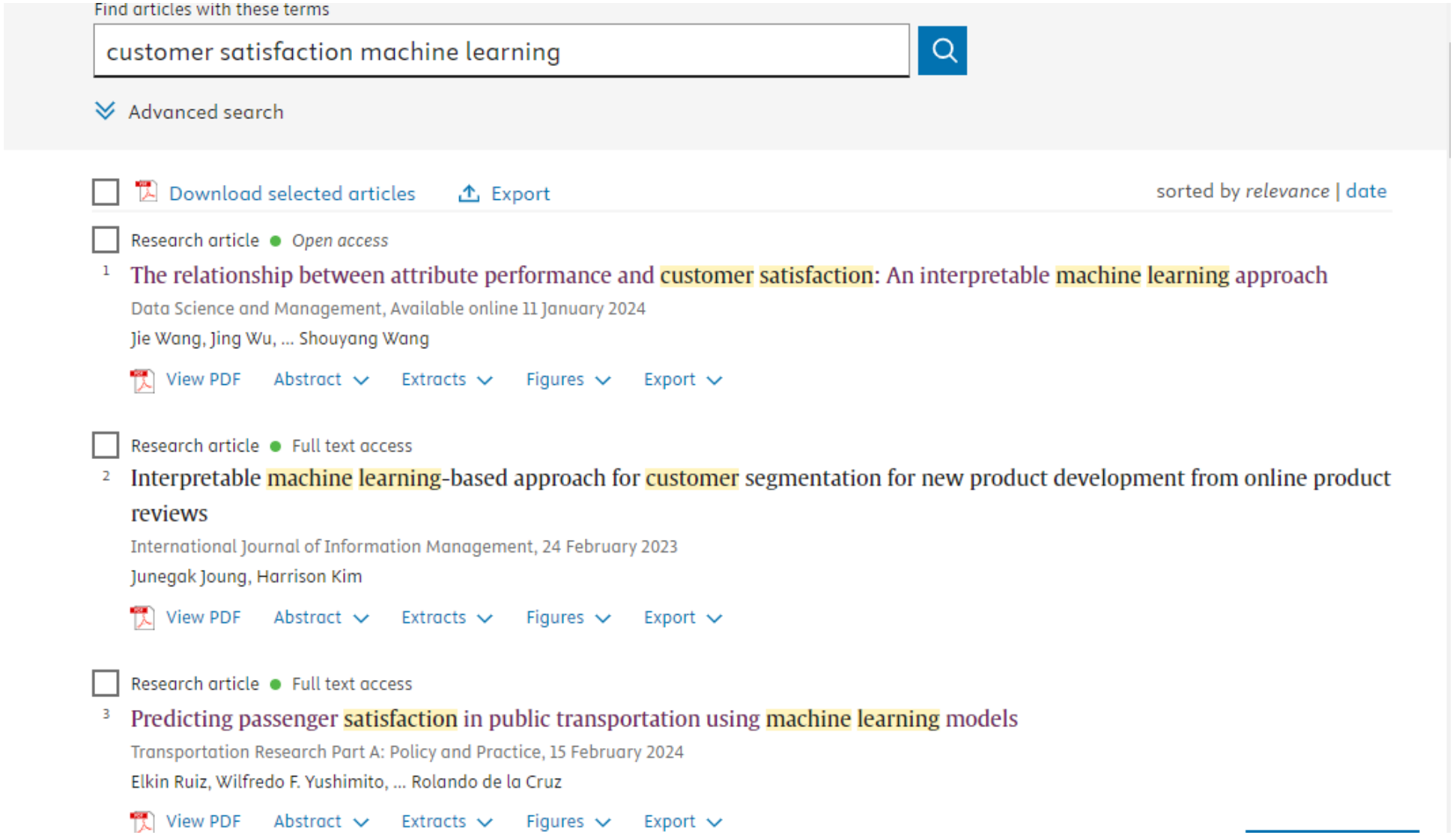

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1 **Revista y año de publicación:**

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Predicting passenger satisfaction in public transportation using machine learning models

Elkin Ruiz [b], Wilfredo F. Yushimito [a,*], Luis Aburto [b,c], Rolando de la Cruz [b,c]

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[c] Data Observatory Foundation, ANID Technology Center, Eliodoro Yáñez 2990, Oficina A5, Providencia, 7510277, Santiago de Chile, Chile

ARTICLE INFO

Keywords:
Bus public transportation
Machine learning
Passenger satisfaction
Prediction

ABSTRACT

Enhancing the understanding of passenger satisfaction in public transportation is crucial for operators to refine transit services and to establish and elevate quality standards. While many researchers have tackled this issue using diverse tools and methods, the prevalent approach involves surveys with discrete choice models or structural equations. However, a common limitation of these models lies in their inherent assumptions and predefined relationships between dependent and independent variables.

To address these limitations, we introduce a novel perspective by harnessing machine

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3 Palabras clave:

Palabras que muestran los temas principales en el artículo de investigación

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1. Introduction

Bus and metro systems contribute to a significant reduction in greenhouse gas emissions, with a 33% and 76% decrease compared to private cars respectively, as noted by Hodges (2010). This underscores the pivotal role of promoting public transportation (PT) in mitigating carbon emissions, curbing air pollution, and addressing other externalities like congestion. However, for PT to effectively compete with private cars, it must excel in various aspects such as availability, schedule, frequency, and trip time, among others. These elements collectively form the quality of service, a crucial metric tied to consumer satisfaction and the perception of the quality and efficiency of the transit service and its demand (Transportation Research Board, 1999; dell'Olio et al., 2018a).

One established method for gauging service quality involves employing customer satisfaction surveys, where customers articulate their opinions and perceptions. They assess various aspects of the service using evaluation scales or satisfaction ratings (dell'Olio et al., 2018b). In some cases, these individual ratings are then assigned weights and consolidated into an index or indicator.

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6 Referencias:

Para tener otros artículos de referencia

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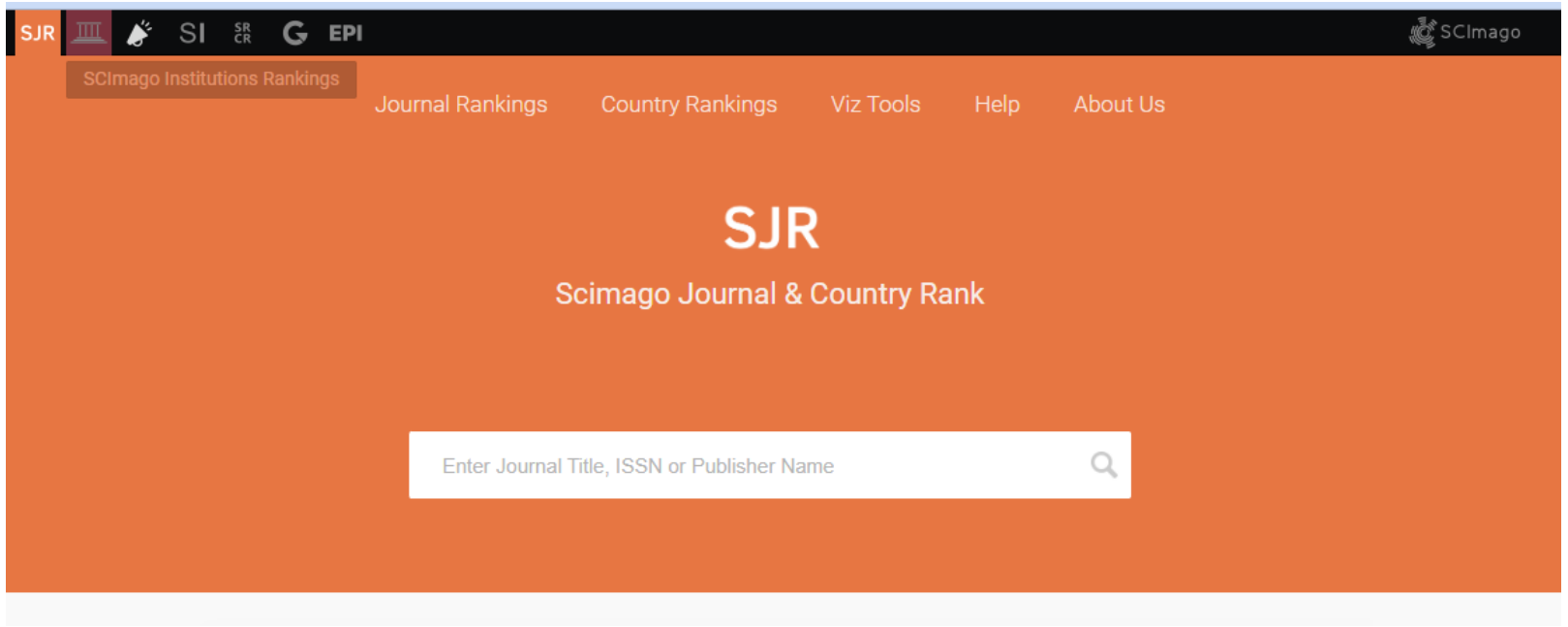

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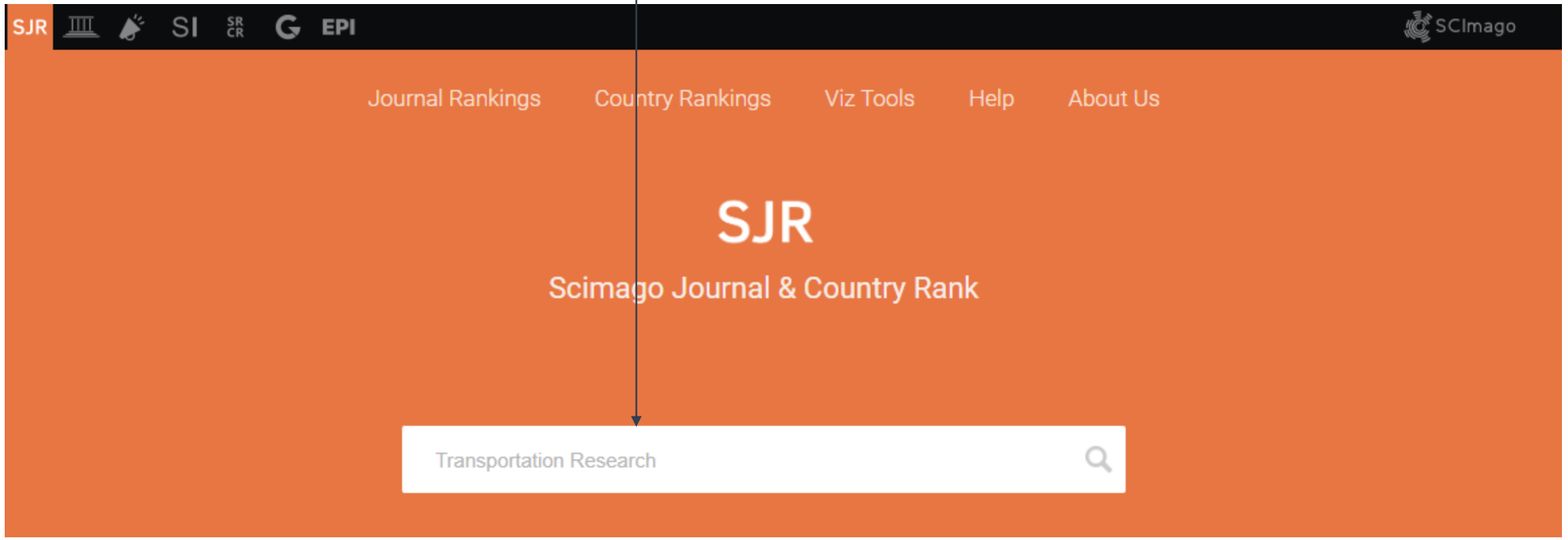

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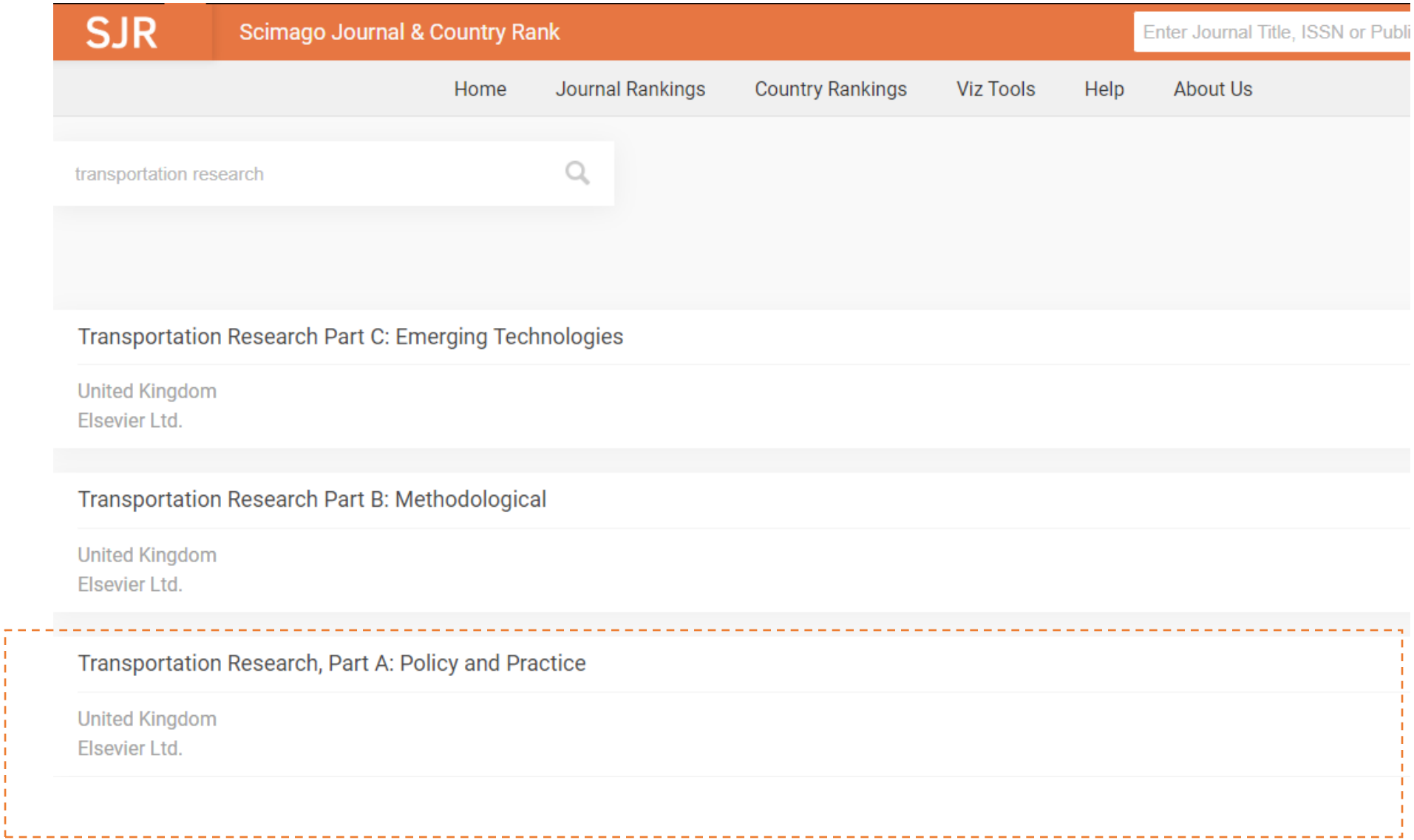

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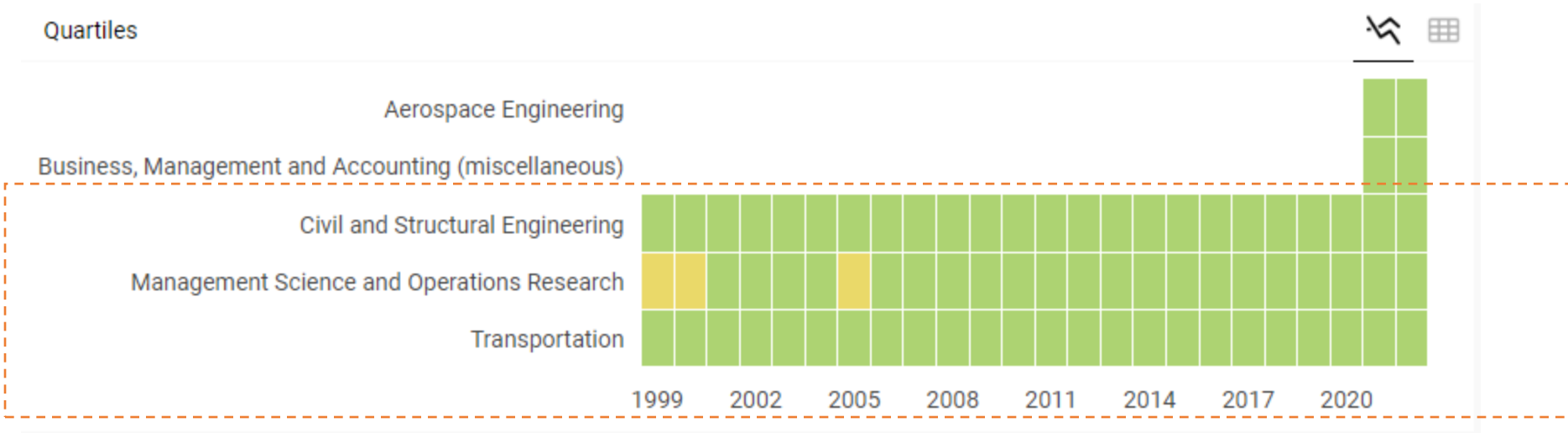

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8 Resumen del artículo:

Importancia
¿En qué ayudará?

Mejorar la comprensión de la satisfacción de los pasajeros en el transporte público es crucial para operadores para perfeccionar los servicios de tránsito y establecer y elevar los estándares de calidad

ABSTRACT

Enhancing the understanding of passenger satisfaction in public transportation is crucial for operators to refine transit services and to establish and elevate quality standards. While many researchers have tackled this issue using diverse tools and methods, the prevalent approach involves surveys with discrete choice models or structural equations. However, a common limitation of these models lies in their inherent assumptions and predefined relationships between dependent and independent variables.

To address these limitations, we introduce a novel perspective by harnessing machine learning (ML) models to gauge and predict passenger satisfaction. ML models are advantageous when dealing with complex, non-linear relationships and massive datasets, and do not rely on predefined assumptions. Thus, in this paper, we evaluate four ML models for the prediction of ratings of the quality of transit service. These models were calibrated using data from the Transantiago bus system in Chile.

Among the ML models, the Random Forest model emerges as the most effective, showcasing its ability to analyze and predict passengers' satisfaction levels. We delve deeper into its capabilities by examining the impact of three pivotal variables on passengers' score ratings: waiting time, bus occupation, and bus speed. The Random Forest model is able to capture threshold values for these variables that significantly influence or have no effect on passenger preferences.

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8 Resumen del artículo:

Antecedentes
¿Qué se ha hecho antes?

Mientras que muchos investigadores han abordado este tema utilizando diversas herramientas y métodos, el enfoque predominante implica encuestas con modelos de elección discreta o ecuaciones estructurales. Sin embargo, una limitación común de estos modelos radica en sus supuestos inherentes y relaciones predefinidas entre variables dependientes e independientes

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8 Resumen del artículo:

Propuesta
¿Qué se piensa hacer?

Para abordar estas limitaciones, presentamos una perspectiva novedosa aprovechando machine learning para medir y predecir la satisfacción de los pasajeros. Los modelos ML son ventajosos cuando se trata de relaciones complejas, no lineales y conjuntos de datos masivos, y no depender de supuestos predefinidos

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8 Resumen del artículo:

Metodología
¿Cómo lo hicieron?

Así, en este artículo, evaluamos cuatro modelos ML para la predicción de calificaciones de la calidad del servicio de tránsito. Estos modelos fueron calibrados usando datos del Sistema de autobuses Transantiago en Chile.

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8 Resumen del artículo:

Resultados
¿Qué se concluyó?

Entre los modelos de ML, el modelo Random Forest emerge como el más efectivo, mostrando su capacidad para analizar y predecir los niveles de satisfacción de los pasajeros. Profundizamos en su capacidades examinando el impacto de tres variables fundamentales en las calificaciones de los pasajeros: tiempo de espera, ocupación del autobús y velocidad del autobús

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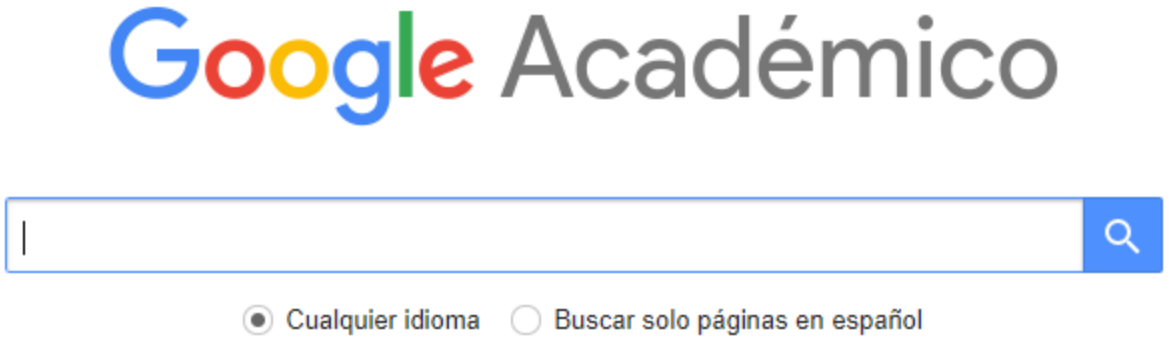

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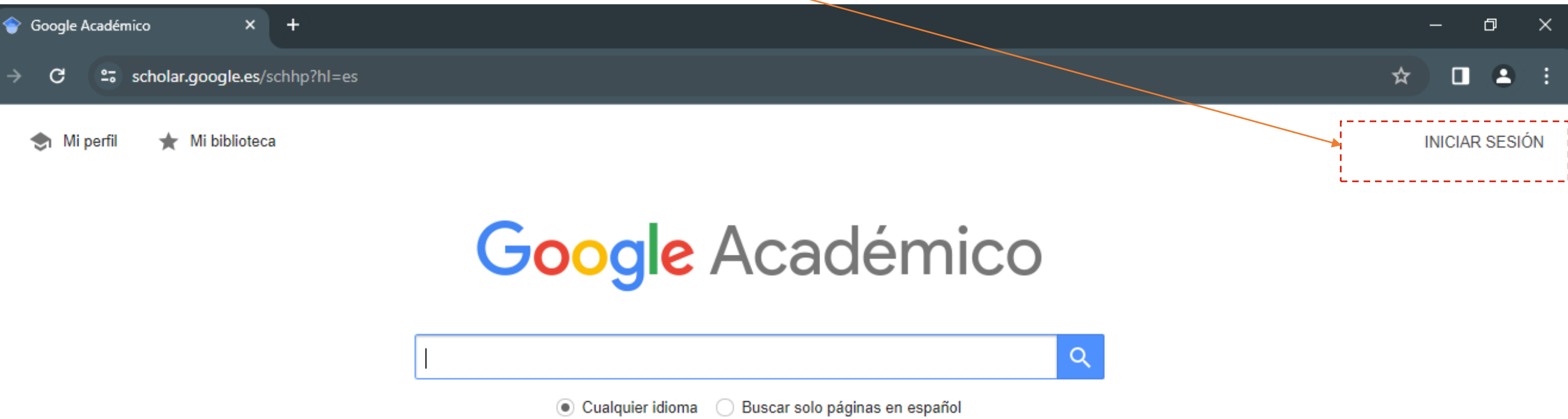

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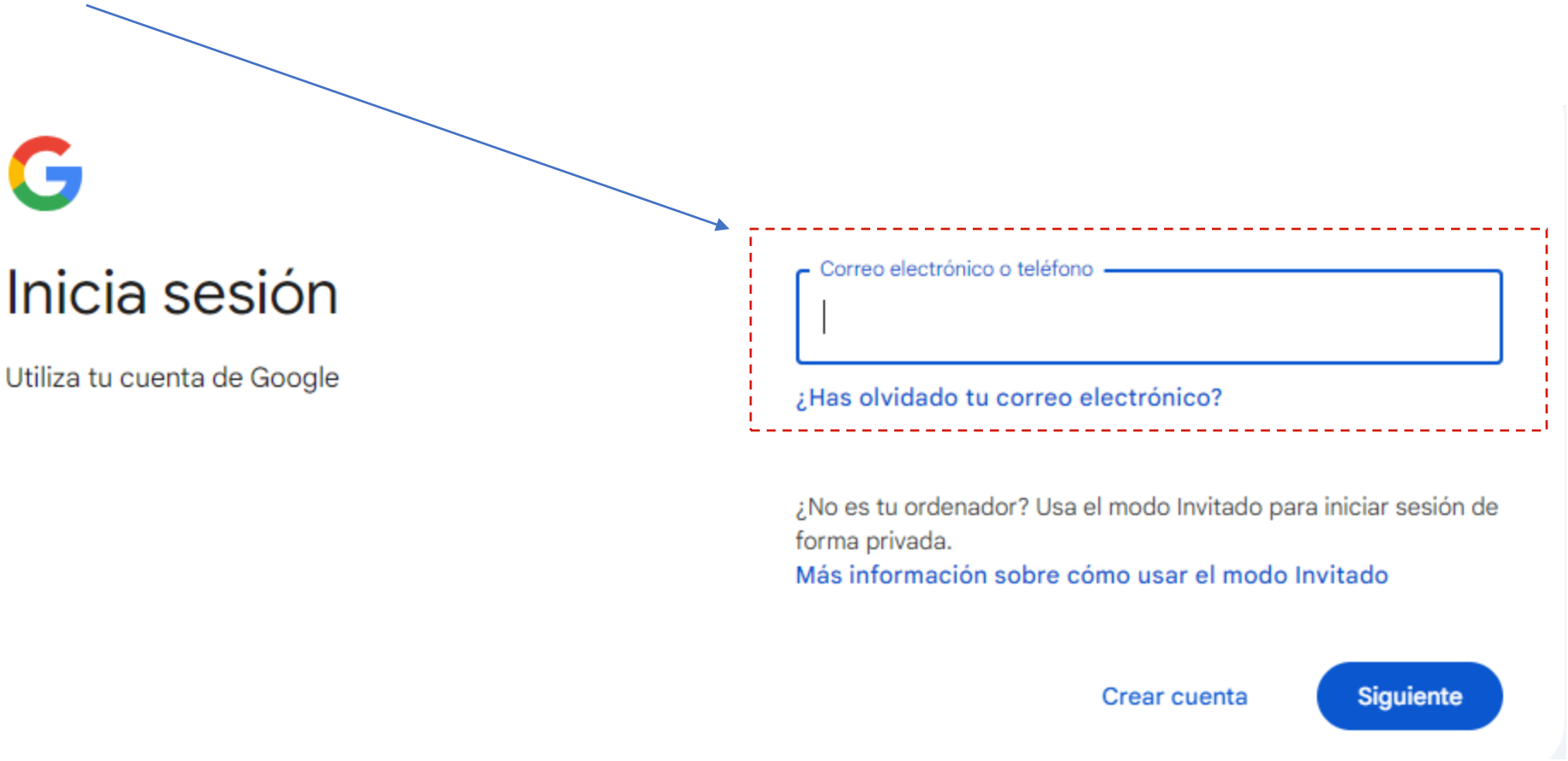

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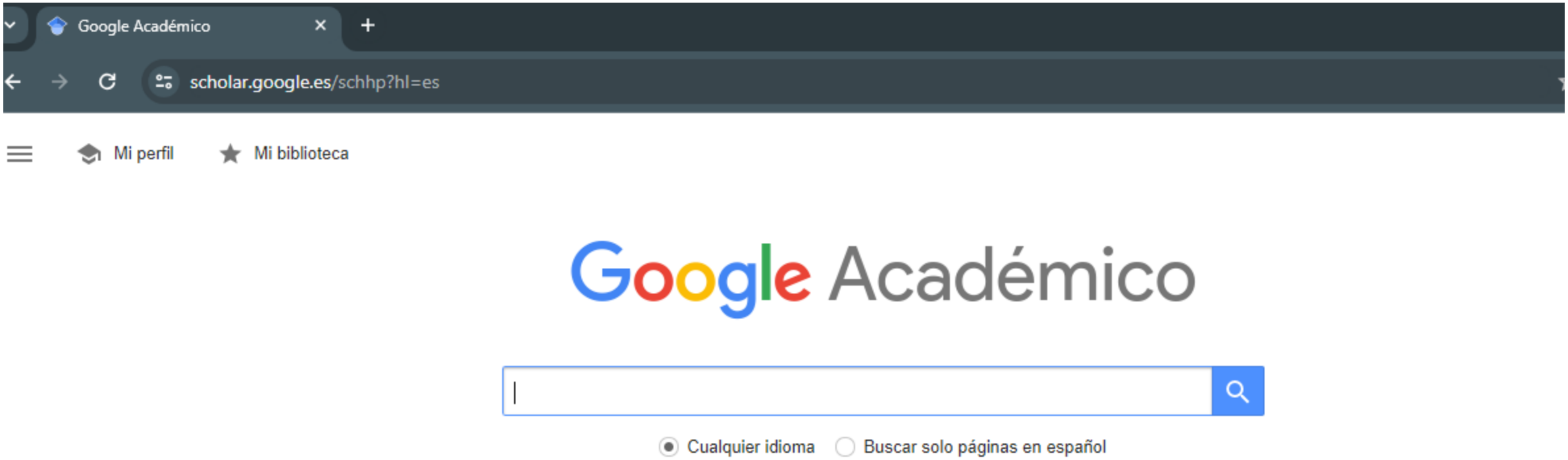
Ya con ello pueden comenzar la búsqueda de artículos



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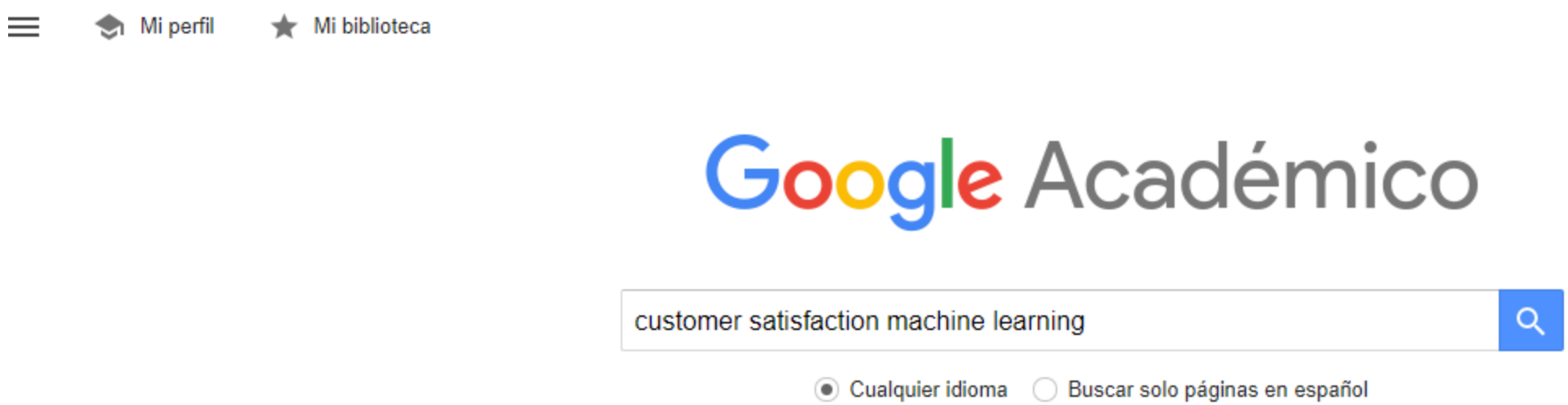

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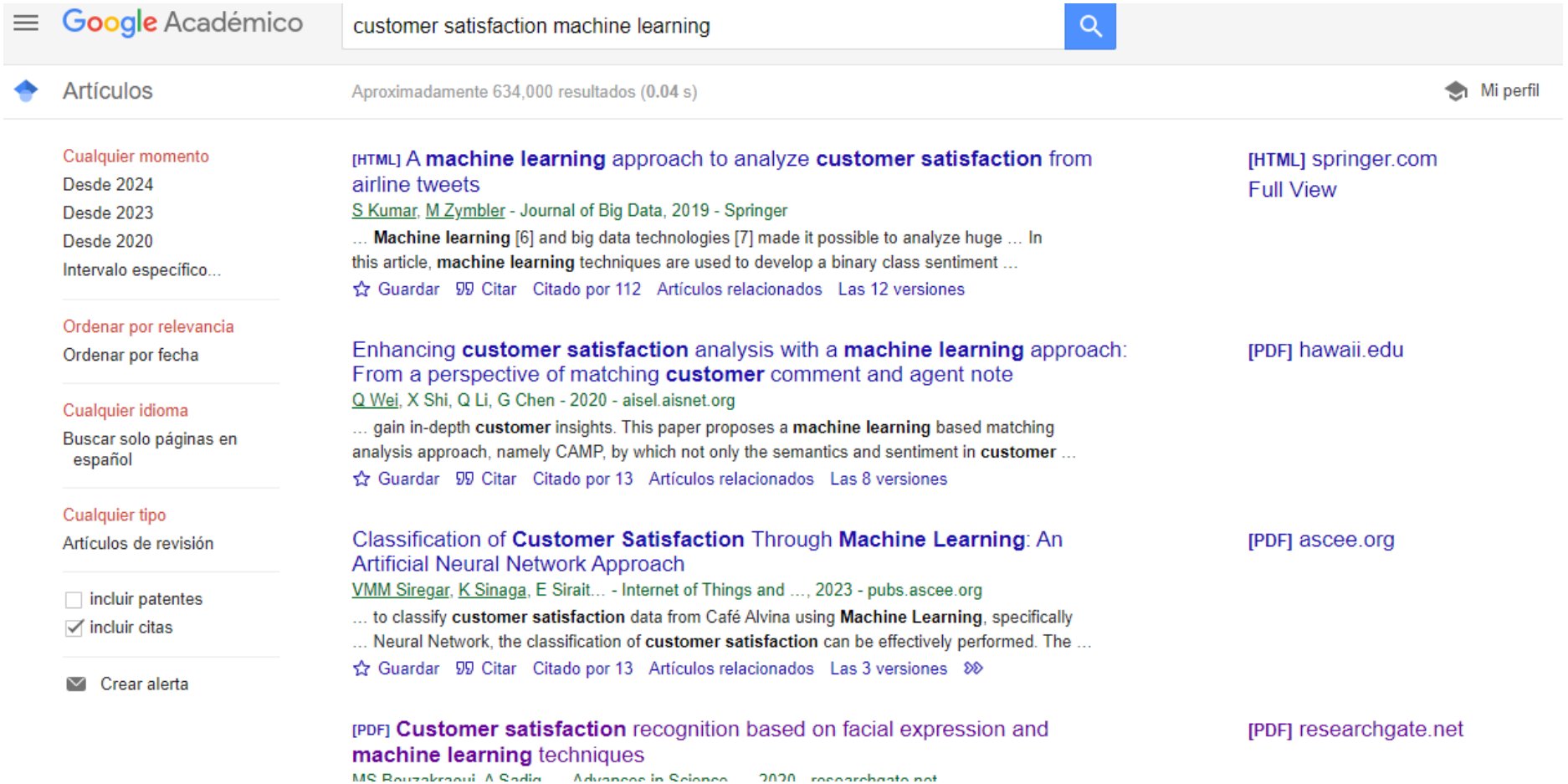

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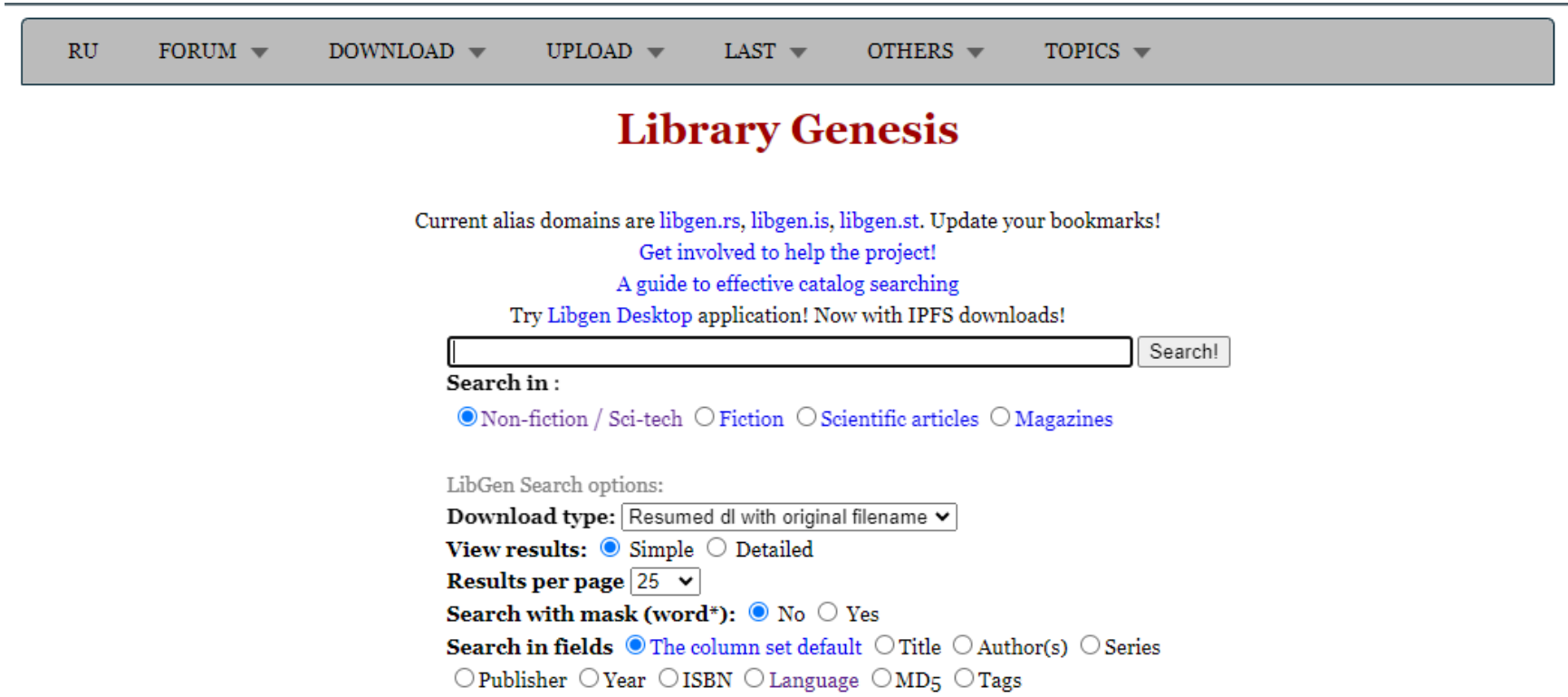

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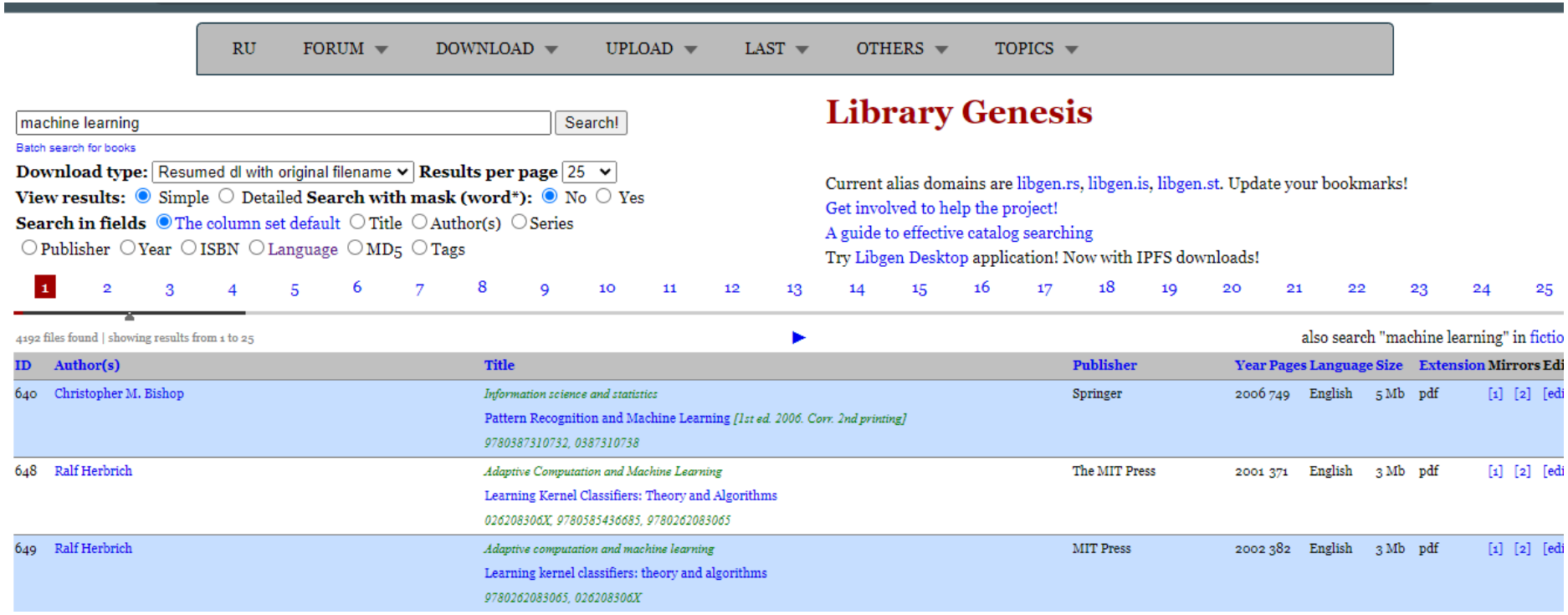

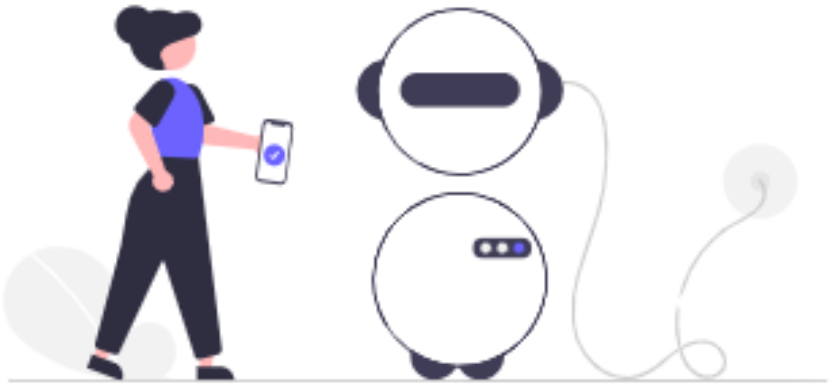

Usando IA para la búsqueda de artículos

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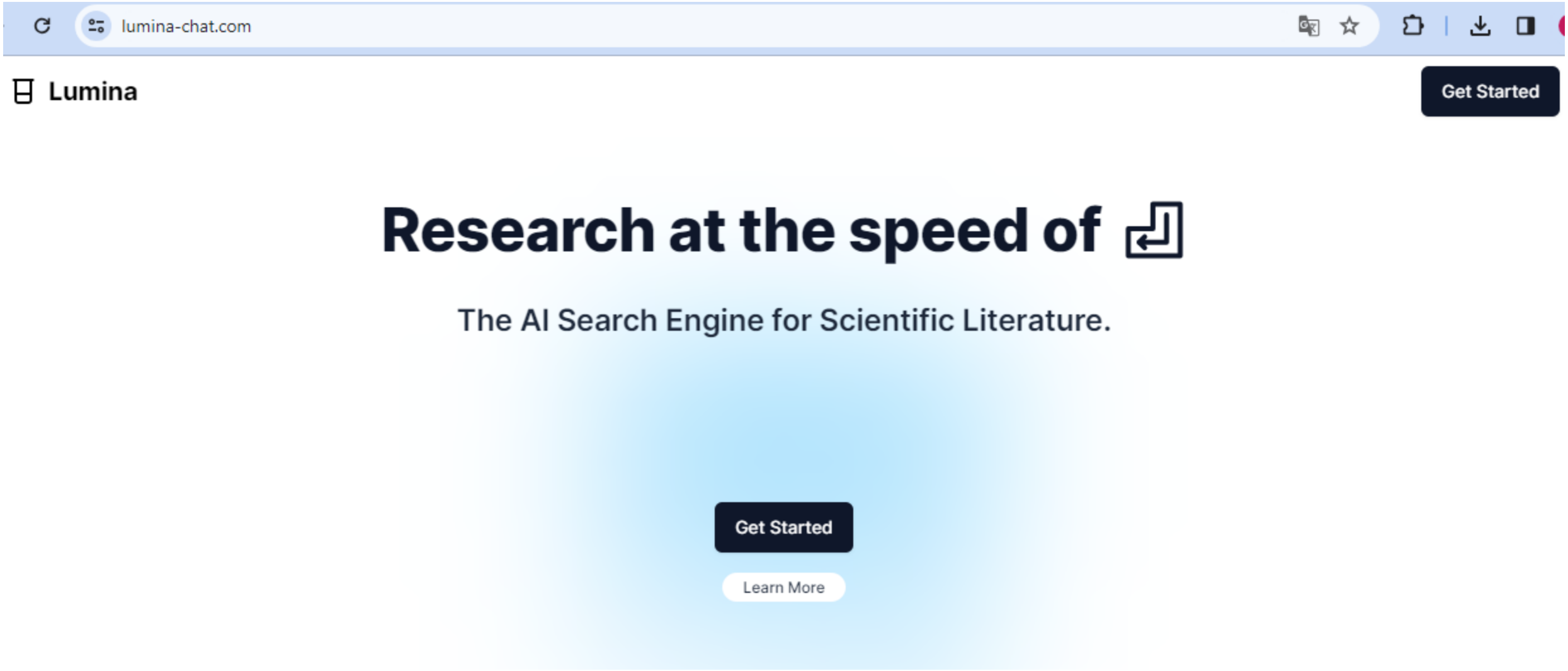

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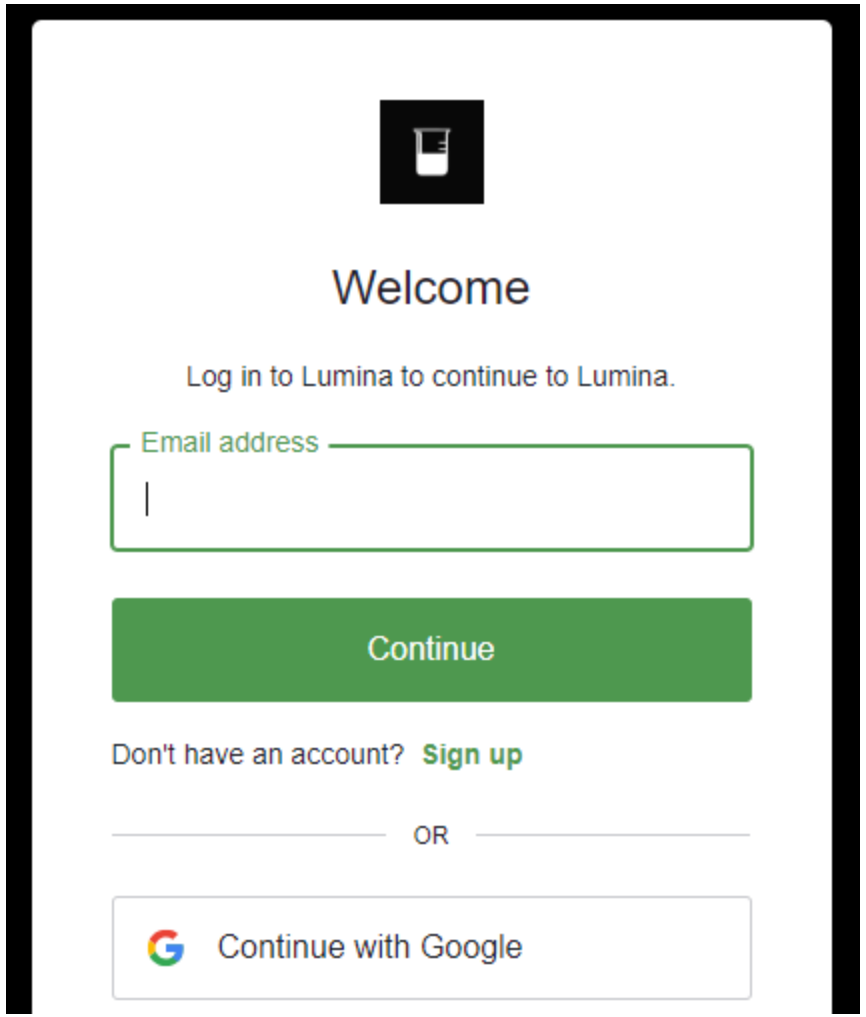

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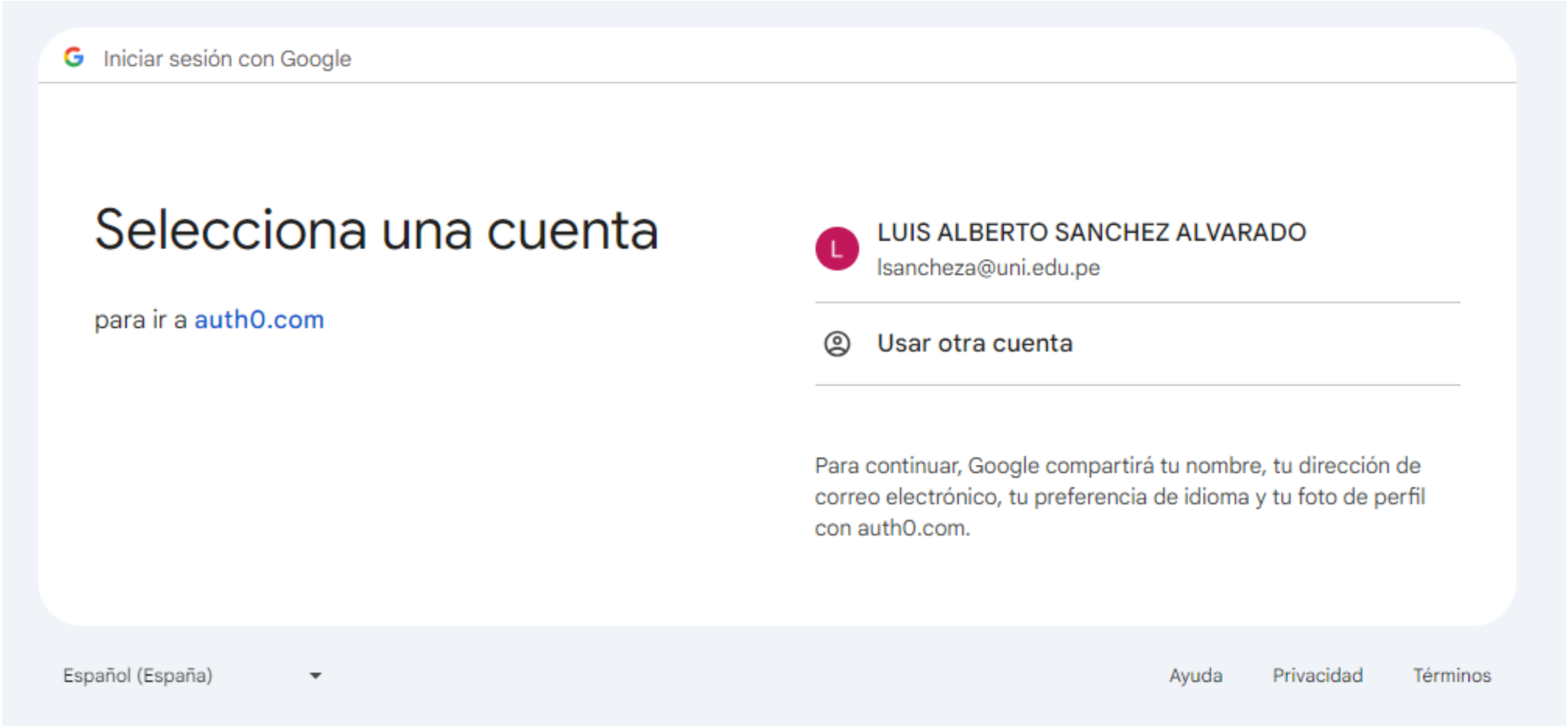

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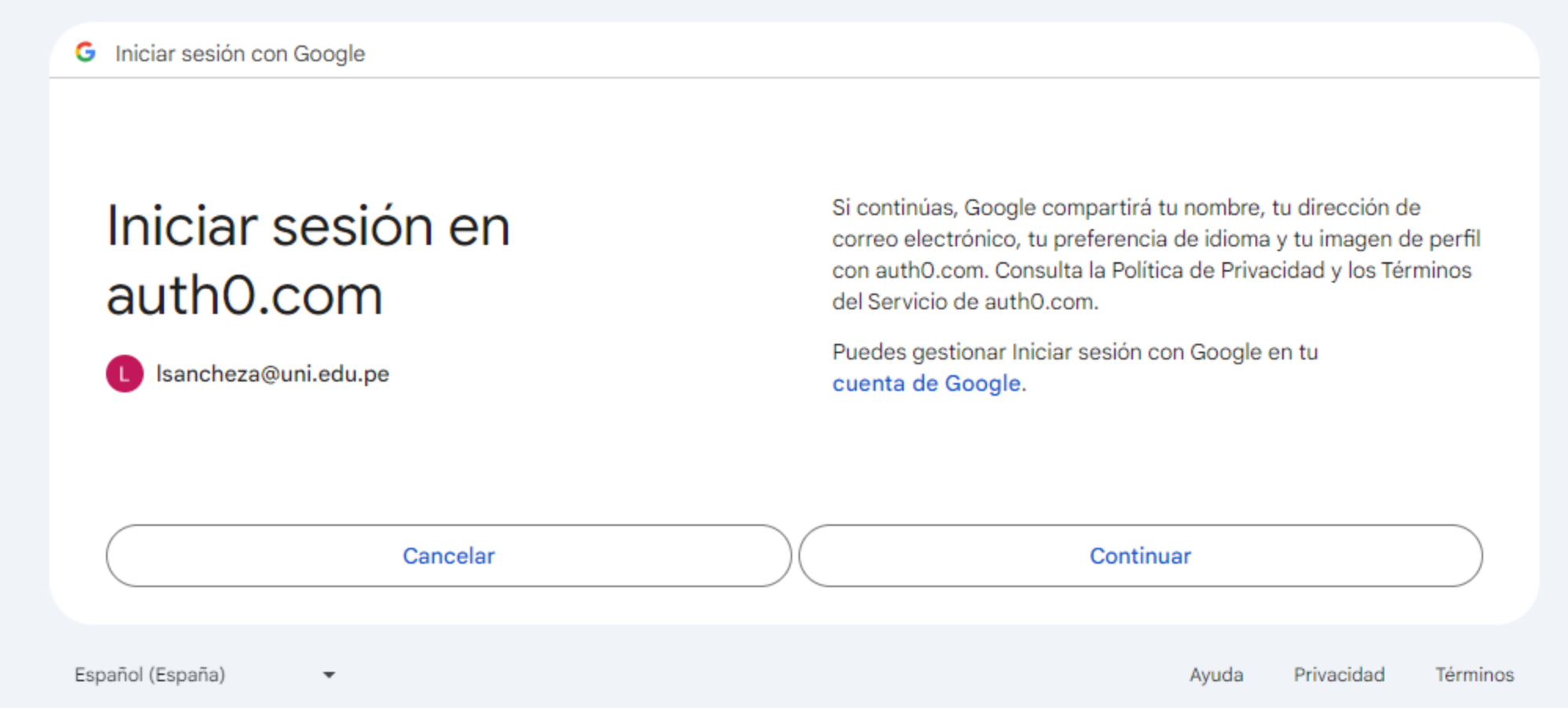

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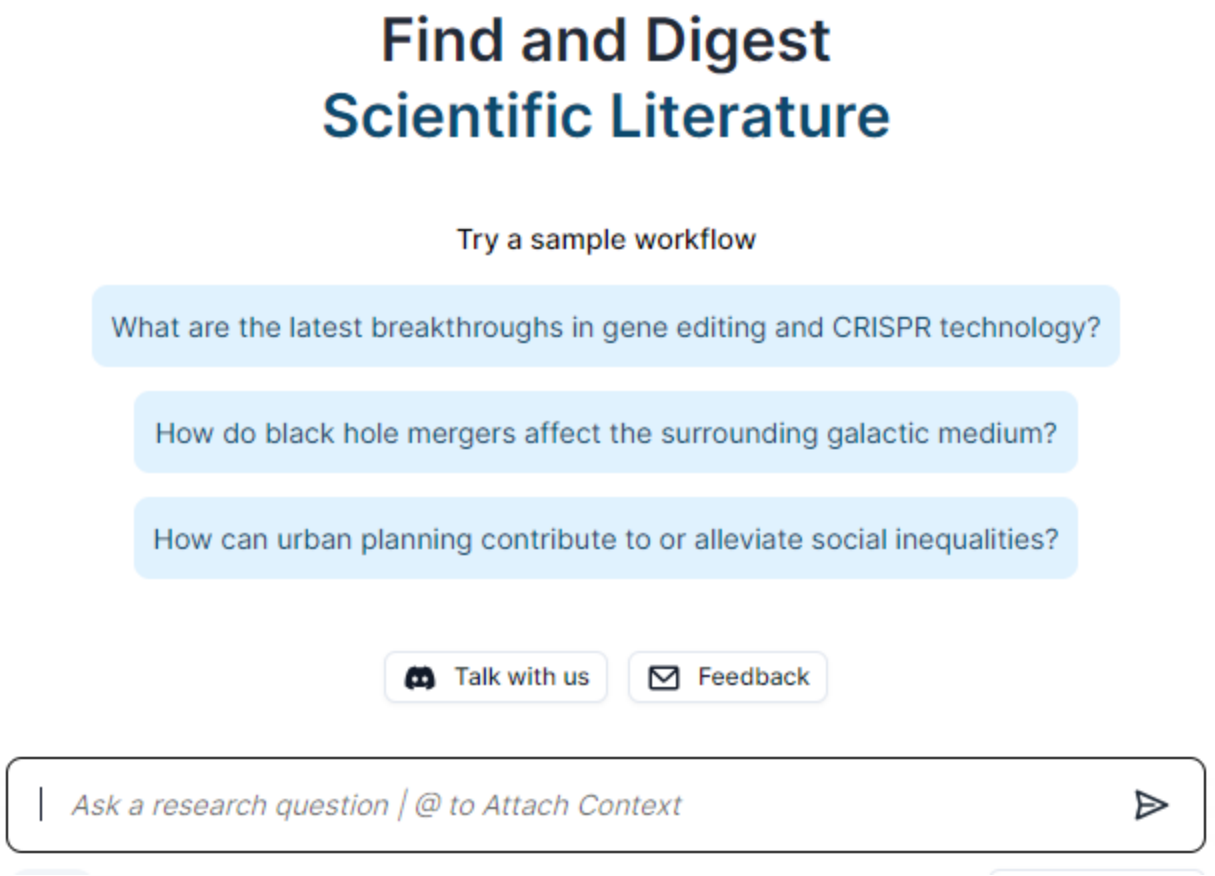

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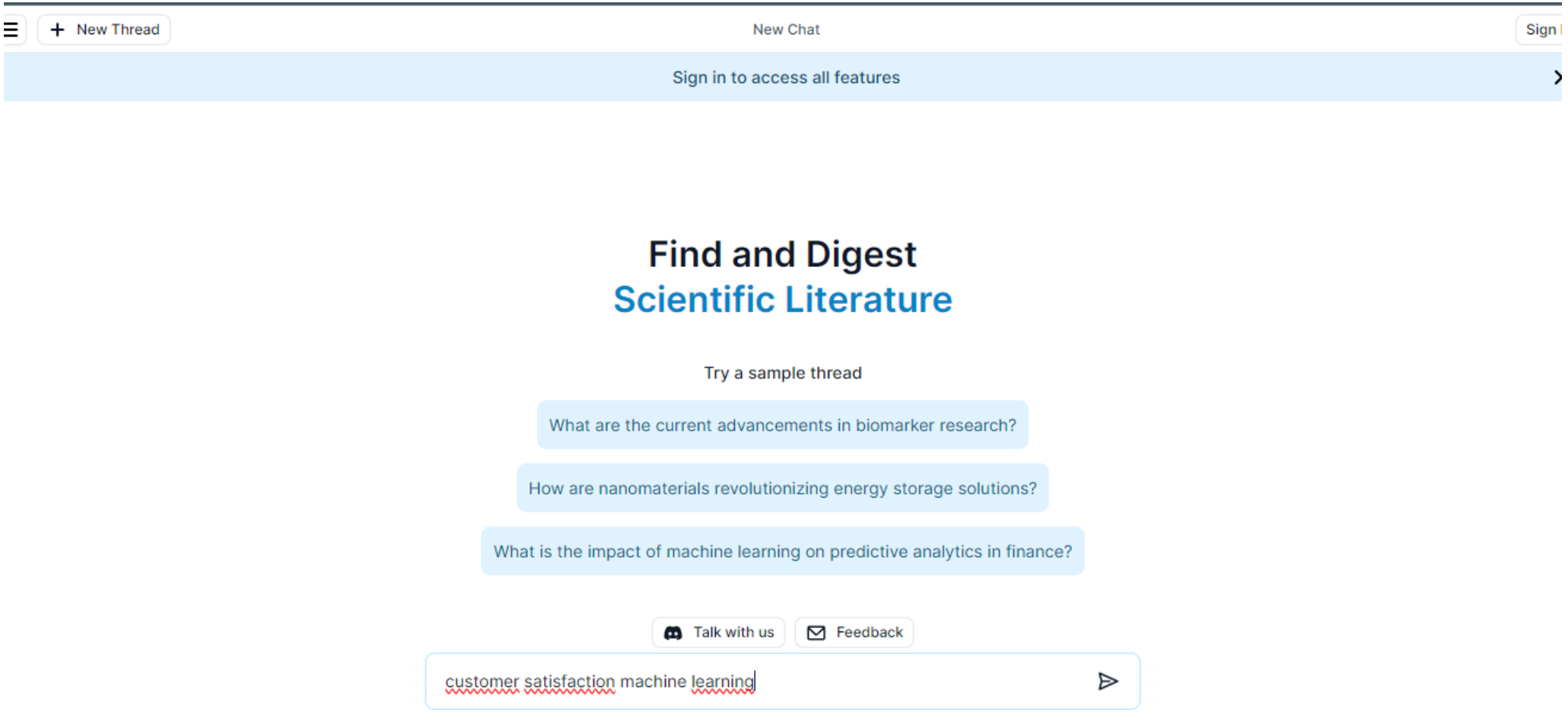

Por donde empezar …

customer satisfaction machine learning

Haiku

Synthesis

Customer satisfaction is a key factor in the success of machine learning models for predicting customer behavior. Research has shown that deep learning approaches can be highly effective in forecasting customer churn and improving customer retention ([1] A DEEP LEAR...). By analyzing customer feedback and satisfaction data, machine learning models can identify patterns and drivers of customer loyalty and repurchase intention ([2] Customer Sa... , [3] Customer Sa...).

For example, one study found that machine learning models using customer satisfaction data achieved accuracy rates of up to 99.7% in predicting customer churn in the telecommunications industry ([1] A DEEP LEAR...). Another study demonstrated the importance of customer satisfaction, trust, and loyalty as predictors of repurchase intention in the retail industry ([4] Customer Sa...). By incorporating customer feedback and satisfaction metrics, machine learning can help organizations better understand and meet

Ask a follow up / @ to Attach Context

Findings

Export CSV

Service modeling of compliments and complaints and its implications for value co-creation

CRC Press eBooks, 2012

High Relevance | Options

The paper demonstrates how text mining techniques can be used to automate the analysis and classification of customer compliments and complaints, which can provide insights into customer satisfaction and value co-creation.

Examination of Satisfaction Level of Bank Service Customers Using Servqual Model

Ekonomske teme, 2018

High Relevance | 2 Citations | Options

The paper examines customer satisfaction in the banking sector using the SERVQUAL model, which is a machine

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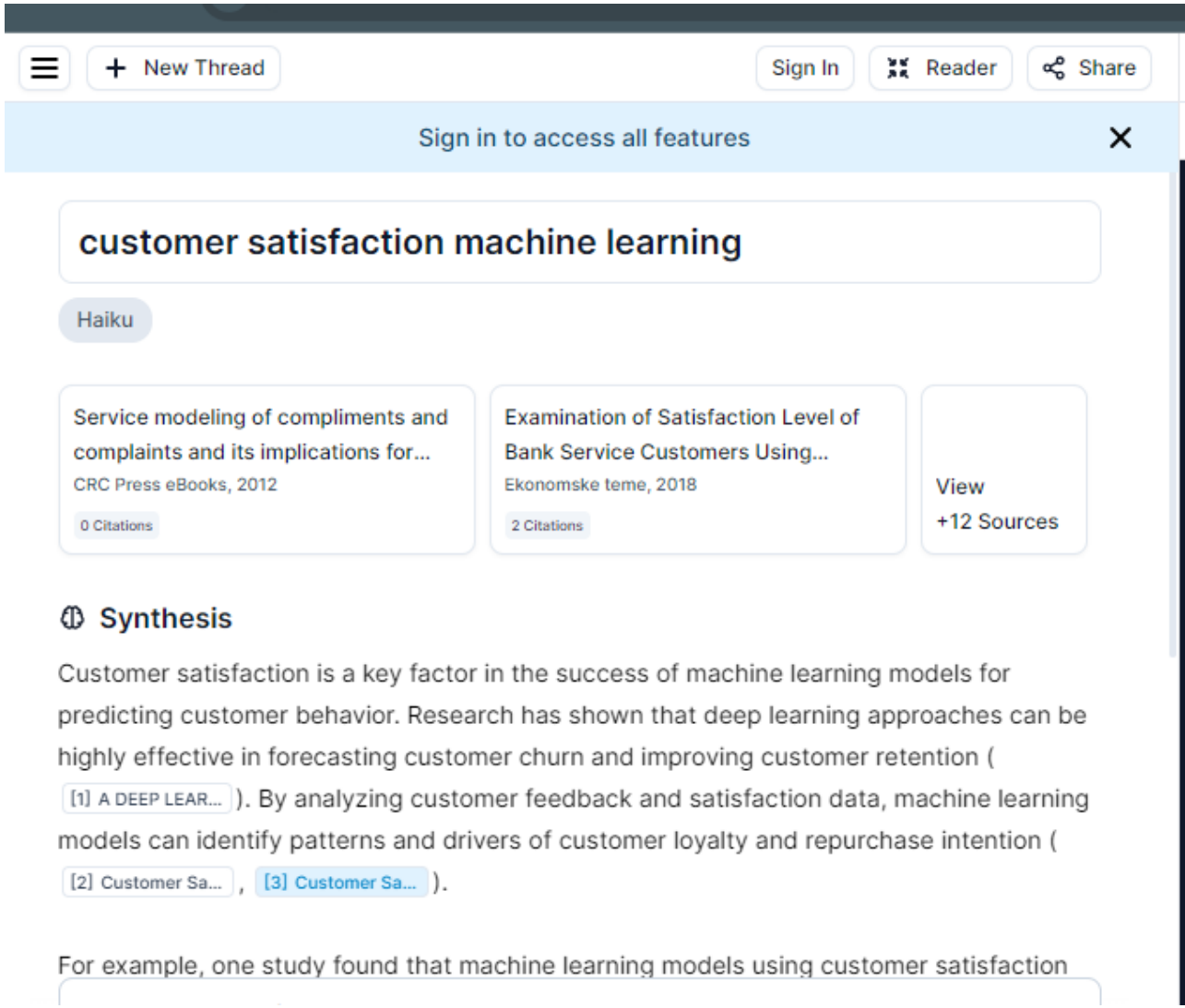
Se puede ir revisando los artículos



Se le puede ir preguntando sobre el tema

y me podrías indicar cuales son las tecnicas de machine learning mas usadas en estos estudios?

Sonnet

Synthesis

Las tÃ©cnicas de machine learning mÃ¡s utilizadas en los estudios mencionados son las redes neuronales (72 estudios [42.6%]), las mÃ¡quinas de vectores de soporte (40 [23.7%]) y los Ã¡rboles de clasificaciÃ³n/decisiÃ³n (34 [20.1%]) [1] Use of machi... . Otras tÃ©cnicas como la lÃ³gica difusa/rough sets, el aprendizaje automÃ¡tico y las redes neuronales profundas tambiÃ©n se mencionan, aunque en menor medida [2] Imbalanced ... , [3] Technology ... .

La mayorÃa de los estudios analizados utilizan un diseÃ±o experimental cuantitativo, que implica la recopilaciÃ³n de datos, el preprocesamiento, el entrenamiento del modelo, las pruebas y la evaluaciÃ³n [4] Research Me... . Las tÃ©cnicas de programaciÃ³n mÃ¡s comunes son Python, con librerÃas como Scikit-learn, Pandas, Matplotlib y Keras [3] Technology ... , [5] Research Me... .

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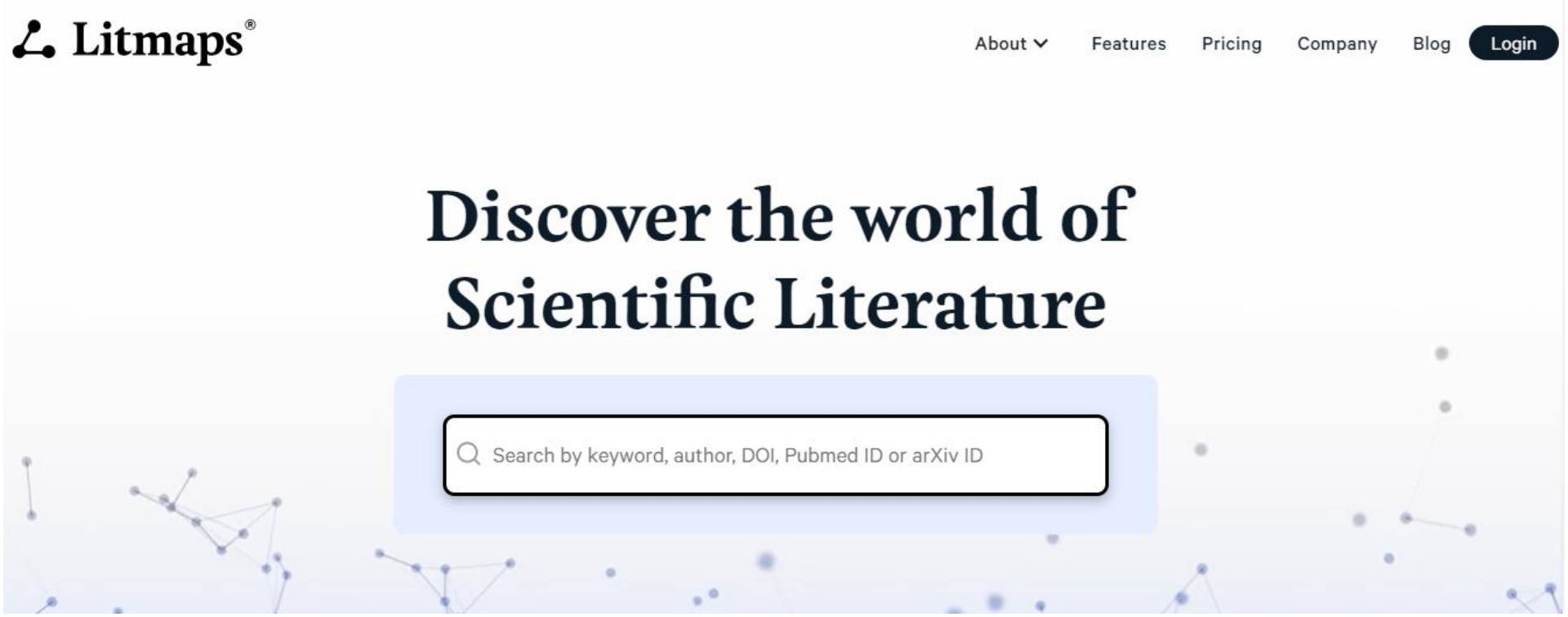
https://www.litmaps.com/



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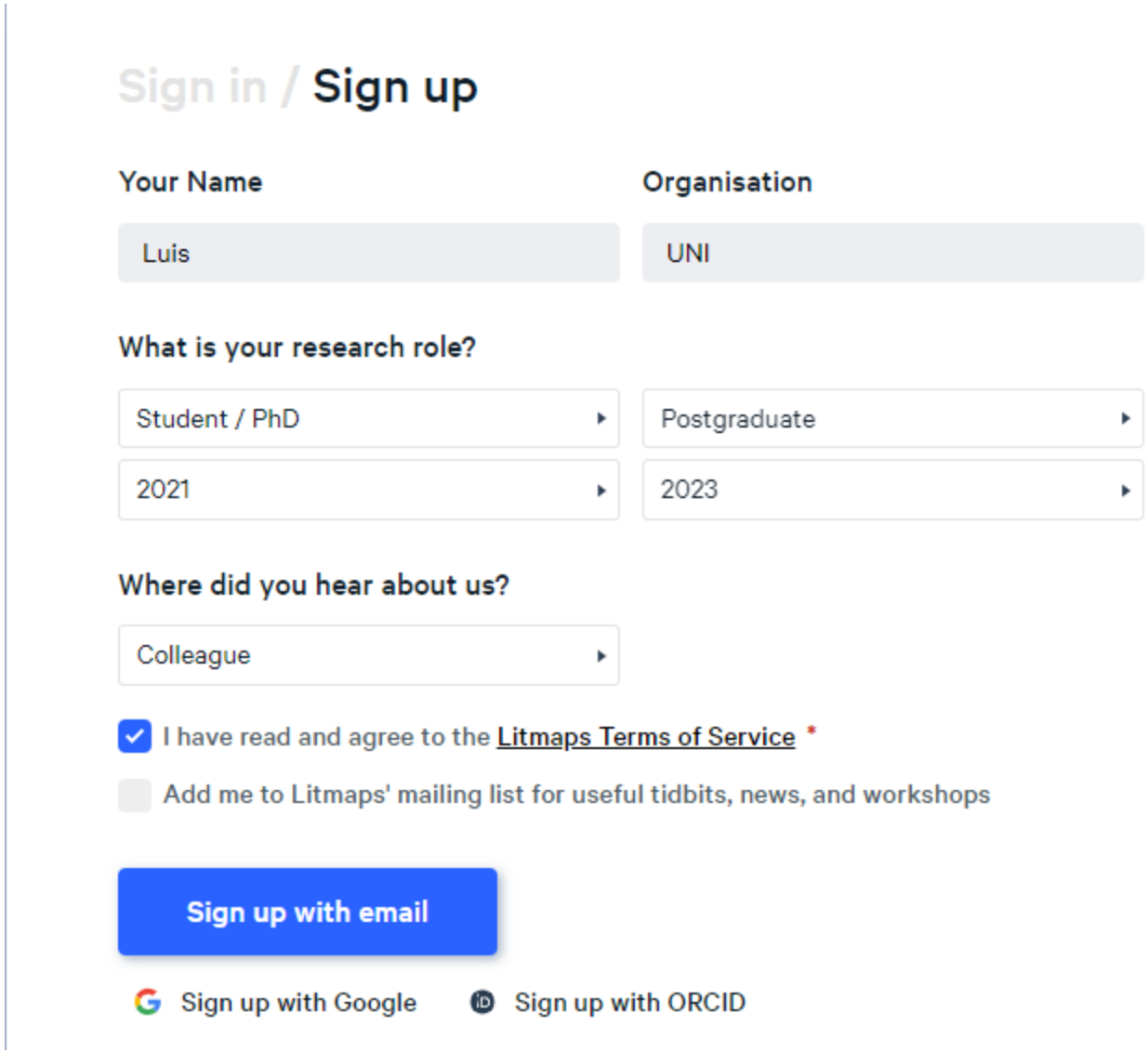
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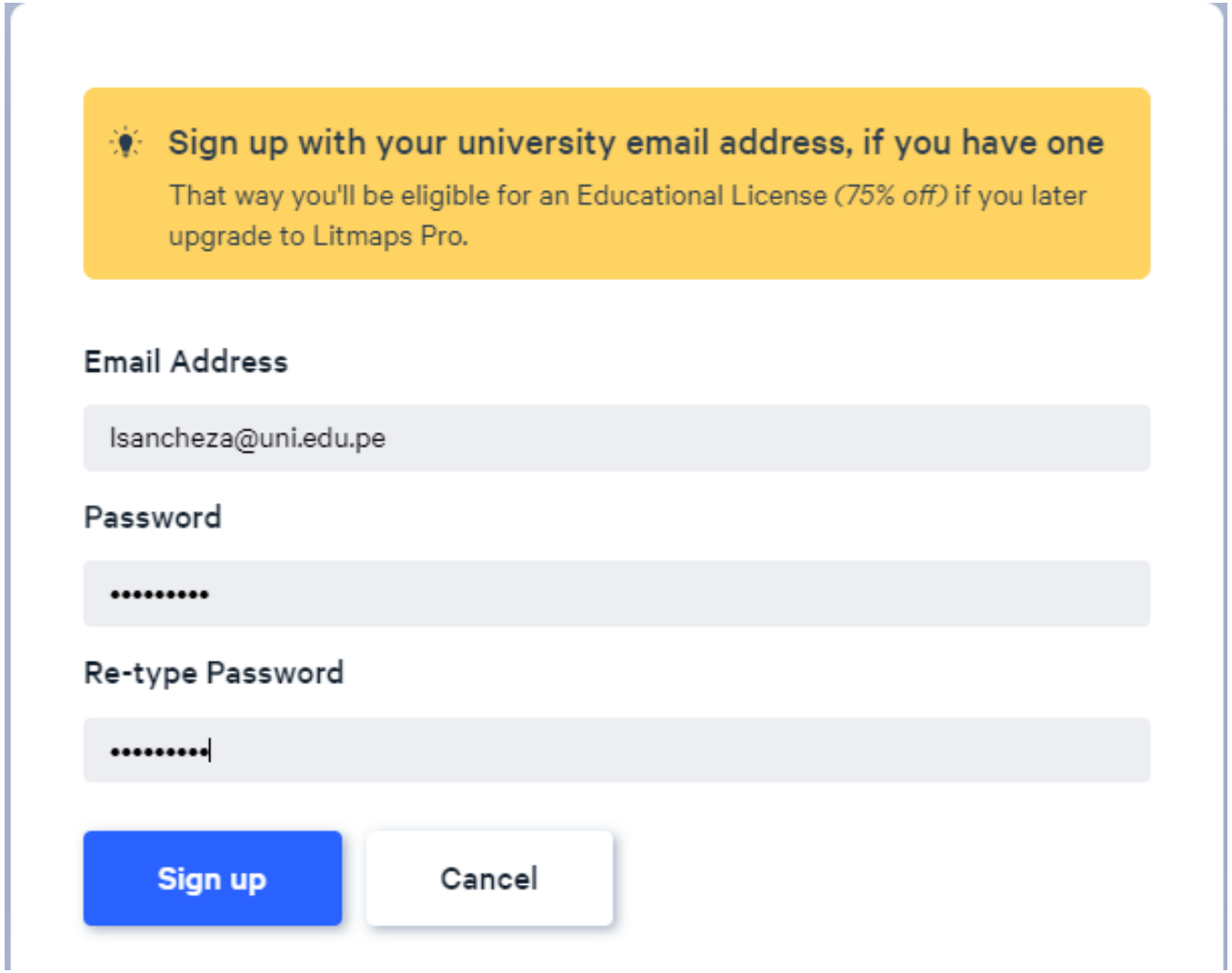
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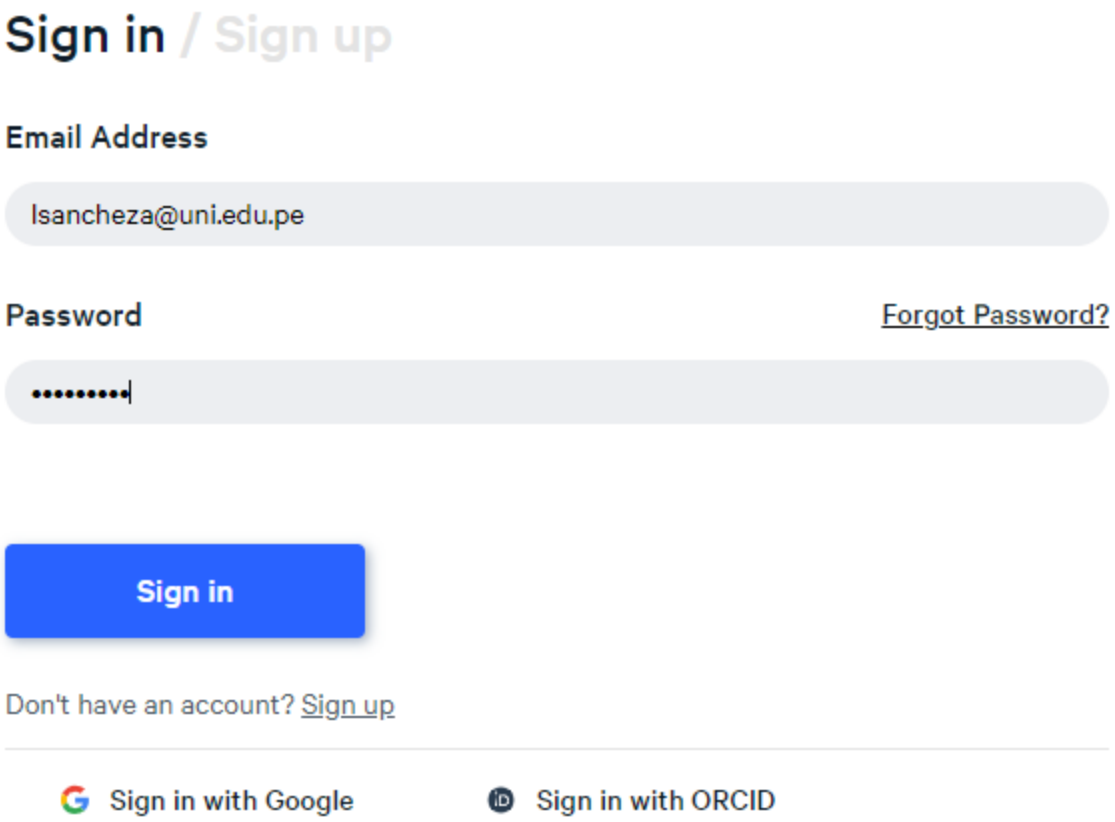
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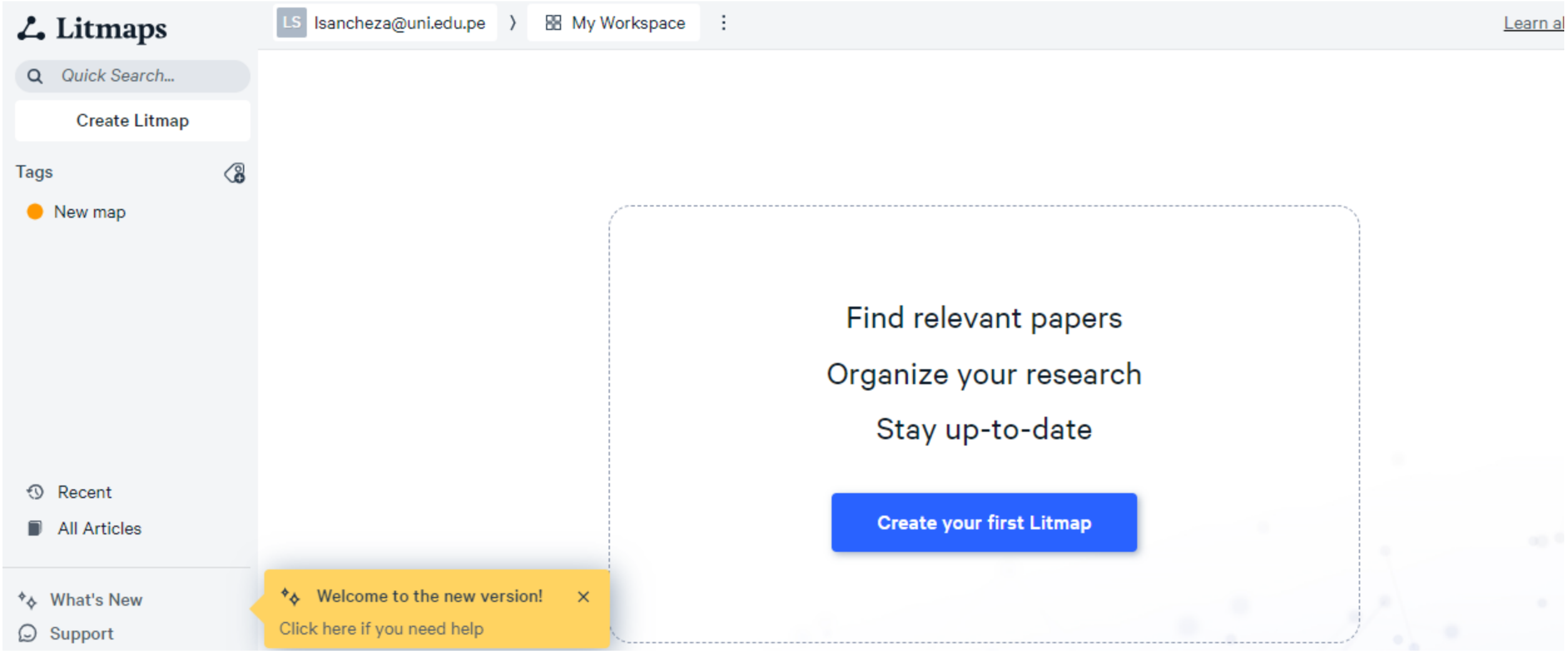
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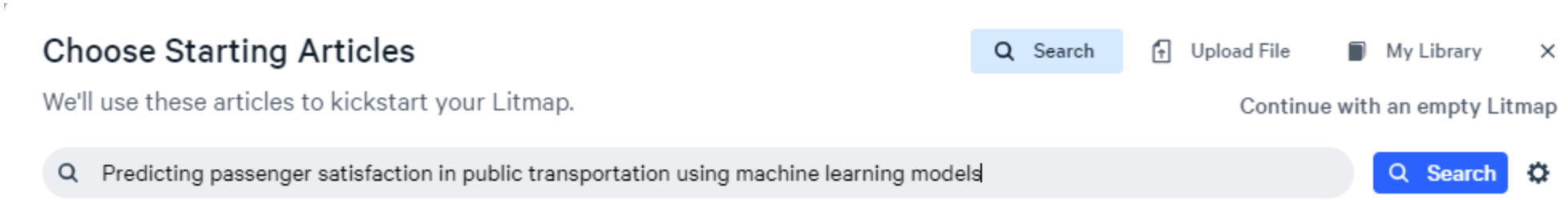
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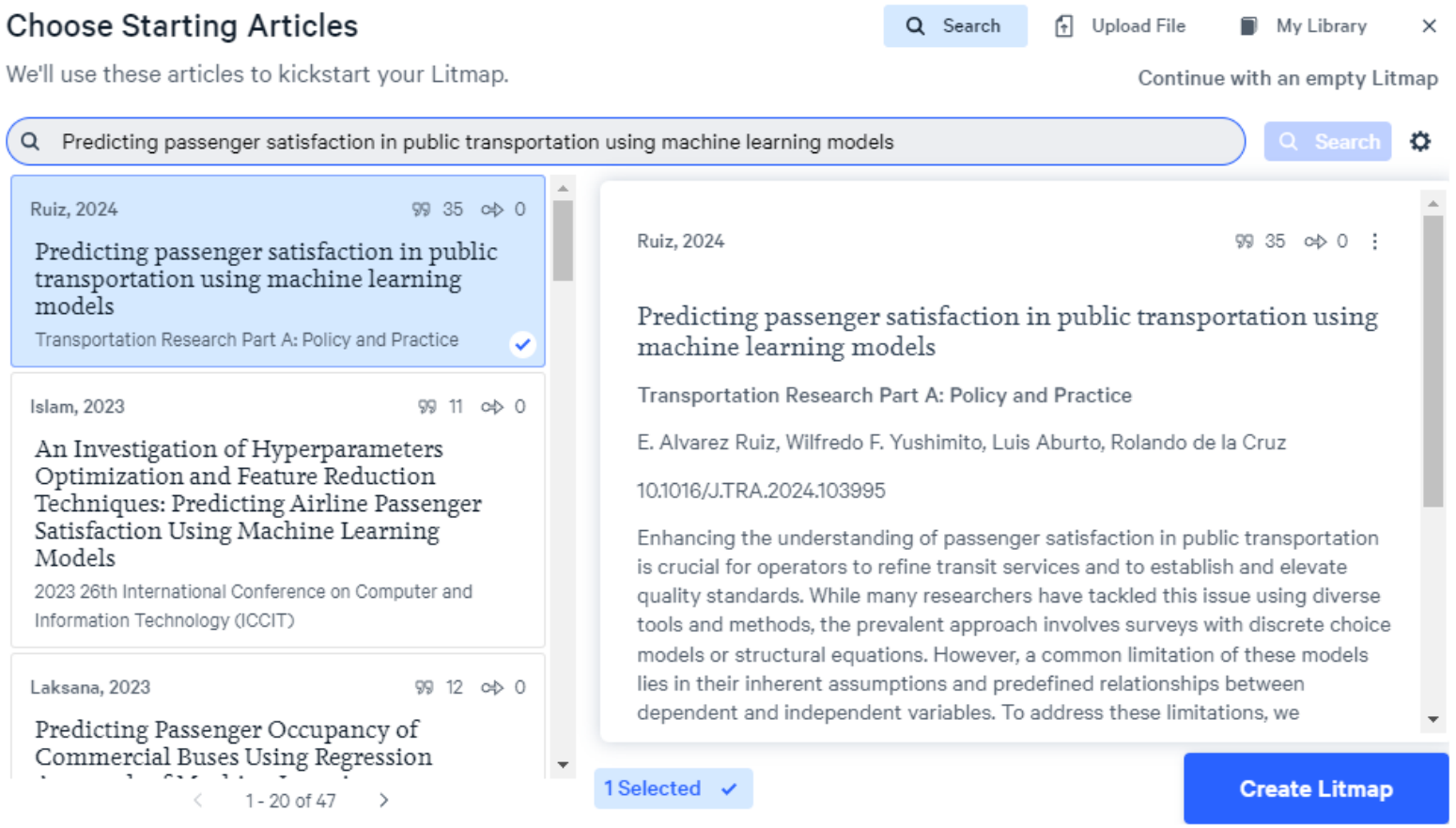

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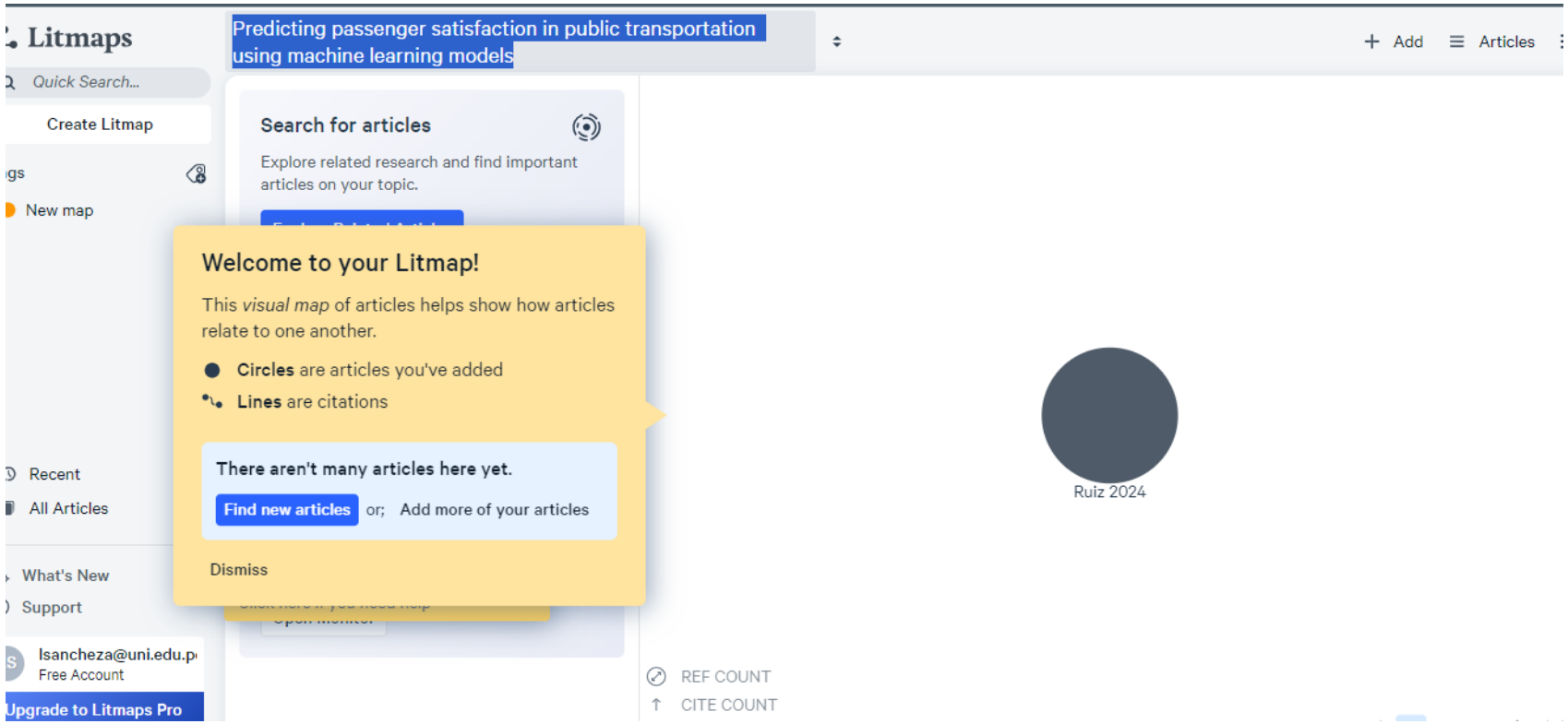
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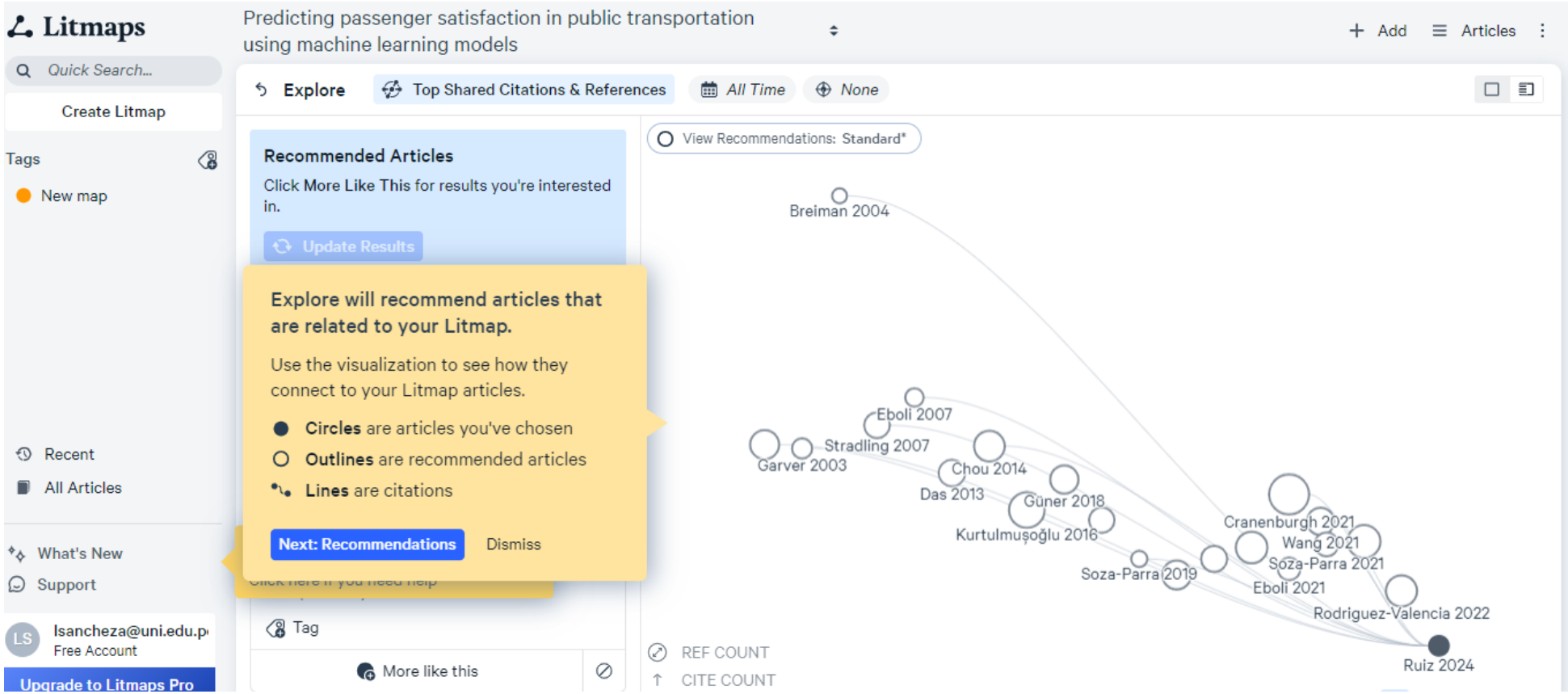

Práctica…

Usando las herramientas de IA haga una búsqueda respecto a su tema de investigación