



# AdTech in 2024 Challenges and Perspectives

# Criteo Timeline

● 2005

Criteo founded in Paris, France on a recommender engine

● 2013

Criteo goes public on NASDAQ, raising \$250 million in IPO

● 2018

Criteo AI Lab established to drive innovation in ML/AI

● 2008

Pivots to personalized retargeting and display advertising, becoming a leader in AdTech

● 2016

Criteo acquires HookLogic, expanding into Retail Media

● 2024

Retail Media revenues as large as Performance Advertising

# Criteo AI Lab



25 researchers, 100 engineers

Including 10 PhD students and part-time researchers  
w/ academia

About 30 papers/year



Strategic role

AI is in the DNA of Criteo since its inception, CAIL's role is to provide cutting-edge capabilities and insights into the direction AI is going



From research to Production

We own most product components that have AI at their core

Our goal is to have a good pipeline between research/ideation to prototyping and production



Collaborative partnerships

Many collaborations with academia incl. datasets

<https://ailab.criteo.com/ressources/>

<https://huggingface.co/criteo>

(CC-by-SA-NC)

CAIL aims at bridging the gap between advanced research and real-world usage (going both ways)



We are at a crossroads like AdTech  
has never known before

# Three disruptive forces

- Privacy

Intricacies of AI-powered advertising and privacy preservation

- LLMs and GenAI

The new kids on the block

- The Economics of Advertising

Advertising as a multilevel value exchange

Section 1

# Privacy

# Sources of Privacy Requirements

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By accepting optional cookies, you consent to allowing us and our partners to store and access personal data on your device, such as browsing behaviour and unique identifiers. Some third parties are outside of the European Economic Area, with varying standards of data protection. See our **privacy policy** for more information on the use of your personal data. Your consent choices apply to [springer.com](#) and applicable subdomains.

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Manage preferences

We use cookies and similar technologies for the following purposes:

- > **Store and/or access information on a device**
- > **Personalised advertising and content, advertising and content measurement, audience research and services development**

and security practices for businesses

targeted advertising and data collection practices

dominant position

AdTech practitioners must navigate a complex landscape

# Consumer sentiment no so clearly marked ?

71%



71% users prefer relevant ads (IAB 2016)

80%



80% prefer "free" (ad-supported) services (IAB 2024)



# Privacy Challenges

## Transparency and Control

Lack of transparency around data collection and use, as well as limited consumer control over their personal information, exacerbates privacy concerns.

## Regulatory Disconnect

Regulators struggle to keep up with rapid technological changes, leading to a disconnect between laws/policies and consumer expectations around privacy.

## Trading Privacy for Value

Consumers often willing to trade personal data for convenient services, discounts, or personalized experiences, creating a tension between privacy and value.

## Balancing Act

Finding the right balance between consumer protection, fostering innovation, ensuring market freedom, and respecting individual privacy is an ongoing challenge.

## Emerging Technologies

New technologies like AI, facial recognition, and IoT devices introduce novel privacy risks that require innovative solutions and careful consideration.

# Some Criteo contributions

sponsored result :)

## Federated Wasserstein Distance

[Alain Rakotomamonjy](#), [Kimia Nadjahi](#), [Liva Ralaivola](#)

ICLR 2024 <https://arxiv.org/abs/2310.01973>

## FedPop: A Bayesian Approach for Personalised Federated Learning

[Nikita Kotelevskii](#), [Maxime Vono](#), [Eric Moulines](#), [Alain Durmus](#)

NeurIPS 2022 <https://arxiv.org/abs/2206.03611>

## AdKDD'21 competition on Privacy-Preserving ML

Result summary: <https://arxiv.org/pdf/2201.13123>

Dataset and code : <https://competitions.codalab.org/competitions/31485>



# Privacy in a Nutshell

- Trust has been lost
- Balance is needed (value, consent, transparency)
- Regulations moves slower than tech
- Conflicting agendas as landscape is reshuffled
- Future (over-)regulation may also harm AI

Section 2

# LLMs and GenAI

# LLMs & GenAI in AdTech

- Analysis

Context (publisher), Ad and brand safety, product catalog analysis

- User-level

User behavior analysis, "common knowledge"  
Deeper interactions (chatbots)

- Generation

GenAI as personalized copy writer for content or ads  
Maybe even more ?

- Business optimization

LLMs can be used to analyze ad performance data, identify patterns, and suggest optimizations to improve campaign effectiveness and ROI.

LLMs and GenAI are still at an early stage of product discovery and their uses will only grow

Where to is anyone's guess !

# LLMs for better understanding

Better understanding for better advertising

## LLMs as better NLP

- Better **contextual analysis** : more relevant advertising (may avoid the “meme” of ads colliding with content)
- **Ad Safety/Brand safety** : ensure the ad shown is appropriate to the place and vice-versa (esp. for self-service ad serving)
- Better **product analysis** (title, description, image), leveraging content better, compared to just memorizing product ids

## LLMs as knowledge bases

<https://www.amazon.science/blog/building-commonsense-e-knowledge-graphs-to-aid-product-recommendation>  
(paper at SIGMOD 2024)



# Conversational Search/Advertising

## Personalization

Conversational AI can provide personalized ad experiences, leveraging user data and real-time interactions to tailor messaging and offers.

## Relevance

Instead of a "one-shot" attempt at recommendation, conversations can get the user to provide additional information on their needs.

## Engagement

Better relevance to a user's needs leads to more engagement and better business outcomes.

## User Privacy Concerns

Extensive data collection and personalization required for conversational ads may raise user privacy concerns, requiring a careful balance between personalization and user preferences.

## User Experience Challenges

Poorly designed or intrusive conversational ads can disrupt the user experience and lead to frustration, potentially damaging brand reputation and trust.

# GenAI Applied to Products



WARHOL is an algorithm for **Personalized Optimal Product Generation** (POPG) which is a formal definition of the Product Innovation stage of the 4-step Marketing process

What Users Want? WARHOL: A Generative Model for Recommendation  
[Jules Samaran](#), [Ugo Tanielian](#), [Romain Beaumont](#), [Flavian Vasile](#)

FashRec workshop, RecSys 2021

<https://arxiv.org/abs/2109.01093v1>



# A new Arms Race ?



## Deep Fakes with Video and Sound

Advanced GenAI can be used to generate misleading content

Many possible nefarious use cases from this technology, at individual level as well as globally

## Content generation and AI detection

GenAI can not only generate personalized content, summarization of piles of data and information, but may also detect AI-generated content or information that does not fit the consensus.



# LLMs/GenAI in a Nutshell

- Massive opportunity and disruptions
- We discover new use cases every week
- Also new risks !  
and shall we mention the costs ?
- How to we (re)gain trust ?

Section 3

# The Economics of Advertising

# The Value of Advertising



## Increased Brand Awareness

Advertising helps businesses reach a wider audience and build recognition for their brand, products, and services.



## Targeted Customer Acquisition

Advertisers can leverage data and targeting capabilities to connect with their ideal customers, leading to more effective lead generation and conversions.



## Revenue Generation for Publishers

Advertising provides a revenue stream for publishers, allowing them to create and distribute high-quality content at no cost to the user.



## Enhanced User Experience

Relevant and well-placed advertisements can enhance the user experience by providing useful information, offers, and content that aligns with their interests.

Advertising is a mutually beneficial exchange that creates value for all parties involved: marketers, publishers, and users. By leveraging data and targeting capabilities, advertising can effectively connect brands with their target audience while supporting the creation and distribution of high-quality content.

# Measurements, causality, and incrementality

## Meta will offer a new ad delivery model which focuses on “incremental conversions”

Meta is hoping that more sophisticated analytics will deliver improved business results



The keyword · Follow  
3 min read · 3 days ago



"half of my advertising budget is wasted and I don't know which one"

Online advertising can provide extremely granular measurements of impact

"Is this thing on ?"

Like Swing States in a political election, advertisers must focus their budgets where they will actually matter.  
Avoid non-buyers, avoid (within reason) buyers, focus on the undecided !

# The Open Internet, a future in question ?

## LLMs to replace websites ?

Why go to a search engine and then read a web page if the search chatbot has the answer for you ?  
Will wearables change the way we access information ?

## Banner ads soon extinct ?

If websites disappear, where will the banners be displayed ?

## Funding content creation ?

Who pays the people providing the data ? Journalists, bloggers, content creators ?  
Subscription models leads to consolidation, what about independents ?



Bringing it all in...

# Key Takeaways



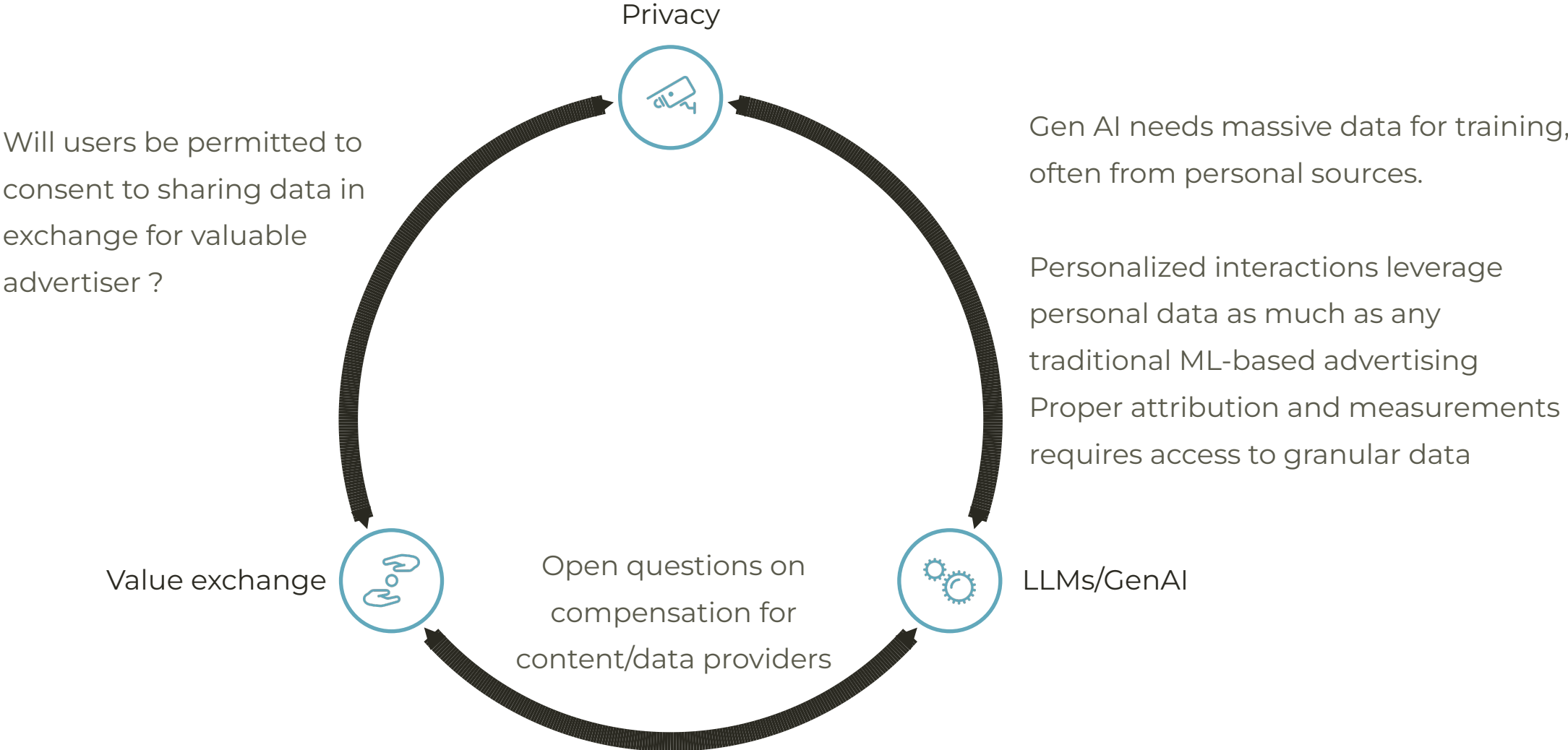
Privacy constraints and regulation may stifle innovation (except in Walled Gardens) as much as protect consumers

LLMs/GenAI offer incredible opportunities and new challenges, may redefine the way we utilize the Internet.

Advertising as an open value exchange is challenged and redefined. Where to advertise ?  
Who will benefit ?



# Those challenges also interact with each other





# And don't forget !

- Fairness
- Bias control
- Risk of discrimination
- Representativity



# CALL TO ACTION

Advertising is a critical element of  
market economy

We touch m(b)illions of people daily

We fund content, freedom of  
information, and freedom of choice

LET YOUR VOICE BE HEARD !



# Thank you !

<https://ailab.criteo.com/>



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