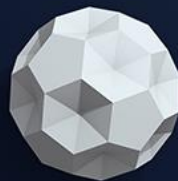


“Digital Revolution”, “Disruptive Innovation” and Conduct Assessment: New Insights Needed for Enforcement?

Thoughts on platforms, foreclosure, and algorithmic collusion

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Dr Cristina Caffarra

CRA Charles River
Associates

“New theory”? “New evidence”? “New standards”?

“**Digital**”: online, platforms, multi-sidedness, externalities, network effects...

... new business models with multiple monetisation strategies + new contract structures + economies of scope + complementarities....

ECONOMISTS – SURELY WE NEED NEW TOOLS!
e.g. when do network effects lead to tipping, when do they not?

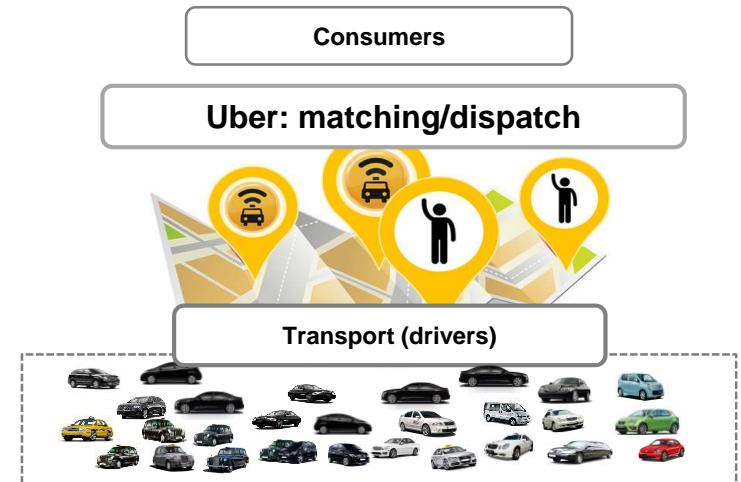
Network effects in lots of markets

- see **Uber**, classic digital platform model

Would expect massive network effects – yet also **multiple entry: idea easy to replicate, multi-homing...**

What we know:

- **There’s no ubiquitous tipping with network effects. Rather the opposite.**
- **Persistent unchallenged dominance is rare.**
- **And multi-homing reduces network effects.**



No need for new methods – but need to understand *new types of effects*

1. Channels of competition

We are systematically ***understating channels of competition*** – and likely competitive constraints – because hard to think about *how substitution works in these structures*

2. Externalities

We are ***overstating anticompetitive effects of contractual restrictions*** because although *externalities are different in online/digital platforms, they still map into the known rationale for vertical restraints*

3. Complementarities

We are ***overstating foreclosure risk*** because *with lots of complementarities, many more complaints* – as rival complement suppliers argue they are “disadvantaged” if not offered the “same terms”, to improve their contractual position.

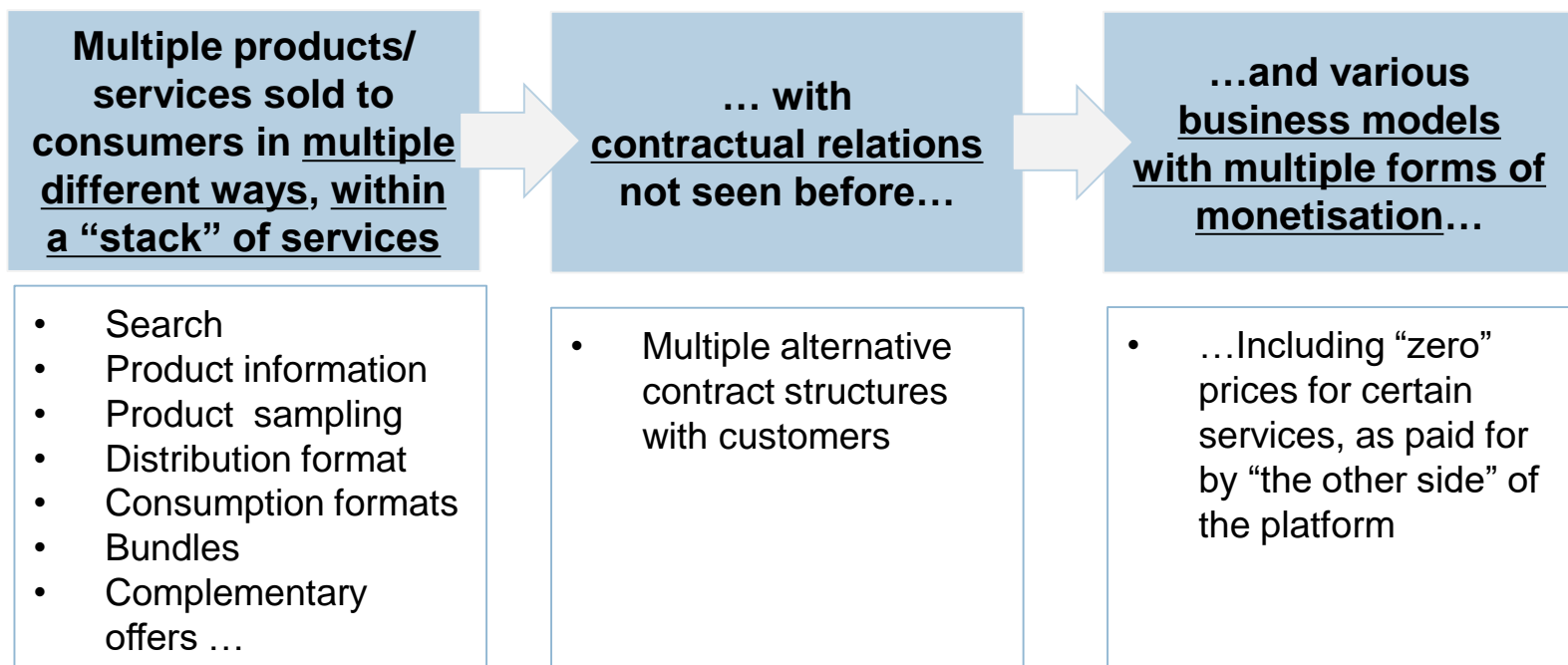
1. Digital competition: challenges for defining markets and assessing competitive constraints



Dr Cristina Caffarra
Oxford RPI Conference

CRA Charles River
Associates

Understanding channels of competition...

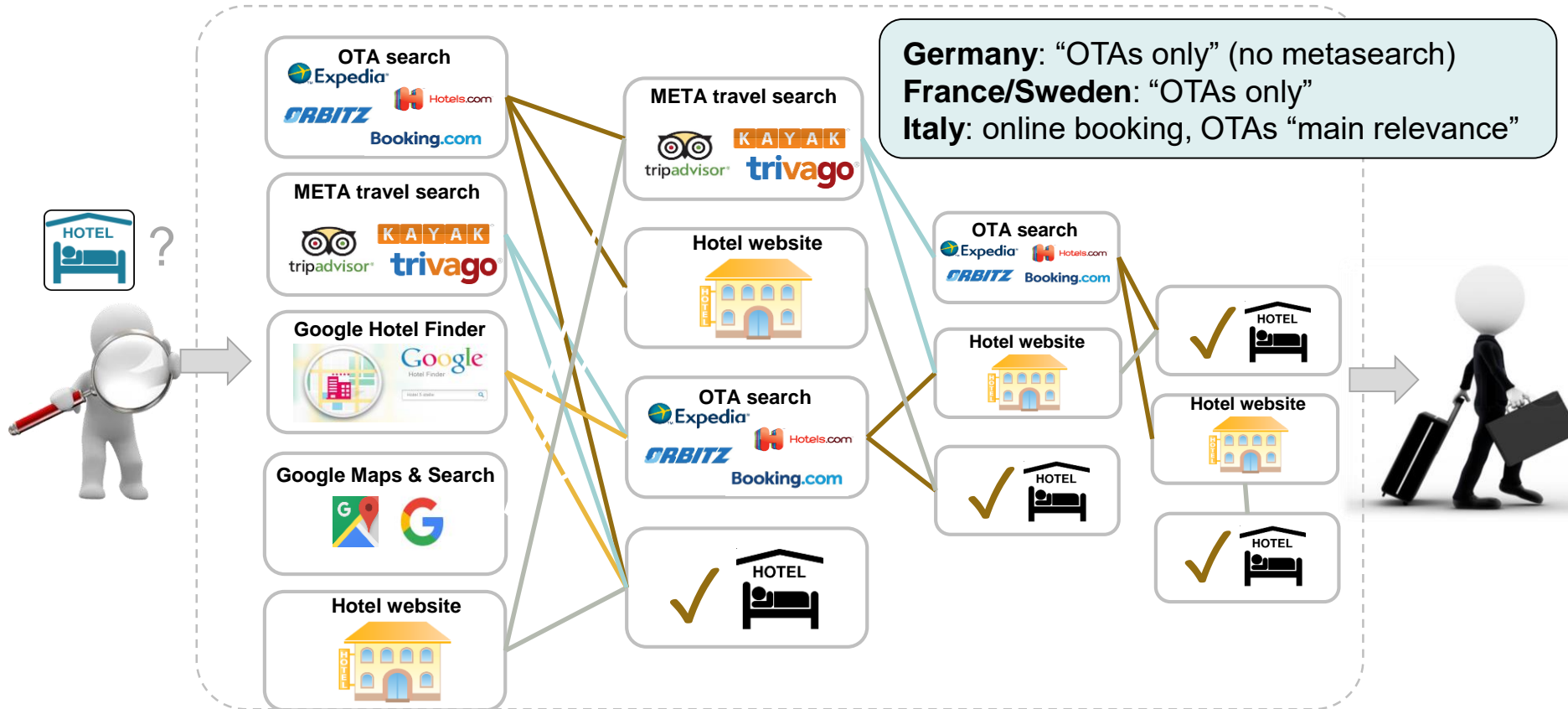


Complex structures, limited data, zero prices: measuring substitution is harder (“SSRQ” anyone?), so typical fallback on narrow separate markets based on the *function* the user performs on the platform

...search / compare / social networking / buy...

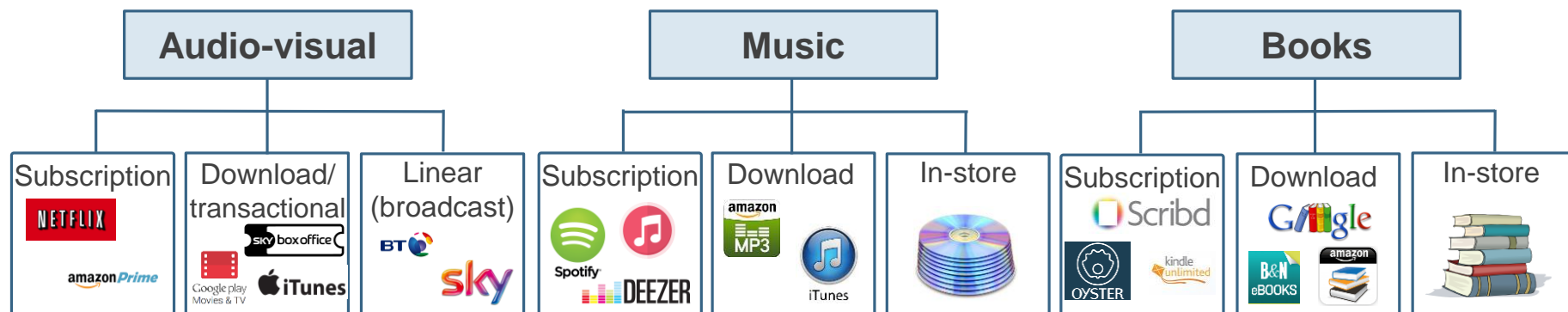
Example: separate market for OTAs?

“Online travel agents” = *searching + comparing + booking on the same site*. Is it a market?



Cannot assume integrated offer unconstrained by “dis-integrated” offers:
consumers can implicitly multi-homing and this changes the competitive interaction

Similar issues in music, books, audio-visual content...



“Different markets” for **download vs subscription** services? **Subscription priced to compete with download**, but highly non-linear price structures, how to do “substitution analysis” around price responses?

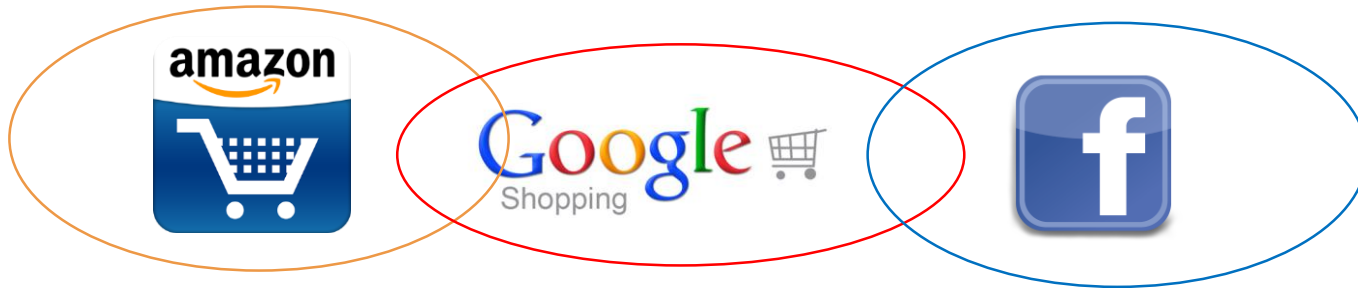
- **Price structures difficult to compare.** Highly non-linear pricing, embedded in complex structures.
- **Zero prices for some products**
- **Price variation is not often there to do the analysis properly**

This makes things difficult: drawing arbitrary lines based on functionality obviously incorrect, but also don't want to make analytical complexity a license to argue for broad markets in all cases

Interaction of platform *and* product substitutability

Because of two-sidedness, even if different platforms “do different things” for consumers, they all want to ***generate interest and increase engagement on the consumer side to get advertising***: trying to get users to the platform, improve the breadth and quality of user experience on the platform.

Competition in “platform attendance”: looking narrowly at “function” is too restrictive



Also need to understand ***new type of substitutability that is generated by the interaction of product substitutability and platform substitutability,***

e.g. losing a sale to another platform means loss of follow-on and other sales -
Amazon using consumer-level data to monitor competitiveness *across products*

Does not mean markets are always broad, but if we overlook this dimension we systematically understate channels of competition and competitive constraints

2. Assessing foreclosure in digital markets



Dr Cristina Caffarra
Oxford RPI Conference

CRA Charles River
Associates

Wider scope for foreclosure claims... and foreclosure risk?

Foreclosure issues “powered up” in digital environments by *huge complementarities*, and much of innovation being about “integrating”

Rivals in the complement claim they are being foreclosed, and network effects and risk of tipping make this urgent and more real.

Do we need new economic theory to deal with these issues? **No**

- **Economic insight does not change: owner of product A *benefits* from multiple **complements**** out there, even if they compete with his own product B. Needs to show credible mechanism whereby a strategy of excluding the rival is *more profitable*.
- **Models/mechanisms that do this have been around for some time:** e.g. dynamic leveraging stories based on network effects (Microsoft); tying models...
- **Now being extended to deal with specificities of the digital world** – two-sided platforms, zero prices on one side. **But still need to overcome “one monopoly”**

Proliferation of complaints does not mean the risk is higher: need a rigorous assessment of ability/incentive to *anticompetitively foreclose*

Theories of harm...

Google Shopping

- “Giving illegal **advantage to own comparison shopping service**” (*from press release*) – presumably more than “self favouritism” in the Decision, e.g. foreclosure via combination of “prominent placement” for Google Shopping and “demotions” in natural search for rivals

Google Android

- OEMs required to give prominent status (default) to Google Search as pre-condition to pre-install the Google Play app store (not available to be pre-installed): **leveraging market power from the app-store to prevent rivals bidding for default status** (a’-la-Microsoft)

Google Adsense

- Provisions preventing third-party sites from using alternative providers for *search ads* - ToH less clear (began pre-Intel so perhaps theory was surplus to requirements?)

...and more

Analogous cases to shopping for **other verticals** (Maps, Local search etc.)?

- **Scraping/expropriation** of content?
- **Refusal to crawl pay news** sites unless they agree to make “First Click Free”?

Mergers: Microsoft/LinkedIn...

“Professional networking”

Complaints from “professional networking services” that potential future integration of LinkedIn into Microsoft’s Office/Windows meant “not a level playing field”



EC concluded integration “could have” disadvantaged rivals, as MSFT’s Office apps are “dominant” + network effects.

=>no integration of LI into Office/Windows for shipments to Europe

Unclear WHY Microsoft would foreclose other networking services once it owned LinkedIn



- How would it be more profitable to foreclose them than allowing users with heterogeneous preferences to continue to use them also?



- How could LinkedIn evolve into a threat to MSFT (dynamic theories)?
- Ability also dubious: people access social networks through the internet, MSFT is not dominant in mobile devices, and people multi-home

We do not need new fundamental theories/tests for foreclosure in these industries.

Just need to carefully apply the tools we have

We do need to think seriously about efficiency justifications. Experimentation is key to innovation, and integrating complements is a central element. Need to apply existing presumption of pro-competitiveness in conglomerate mergers and resist urge to pander to claims for “equal treatment” unless foreclosure risks can be evidenced

3. Rise of the (price-fixing) robots?



Algorithmic collusion...

AI raises the possibility of fundamental social change....

But are specific concerns around algorithmic collusion warranted?

- Legal question of whether firms are culpable for algorithms' actions
- But, setting this aside, is it even true that algorithms can collude more easily?
- Not at all clear in our view

If algorithms get this clever we probably have bigger fish to fry!

Stephen Hawking warns artificial intelligence could end mankind

By Rory Cellan-Jones
Technology correspondent

2 December 2014 | Technology

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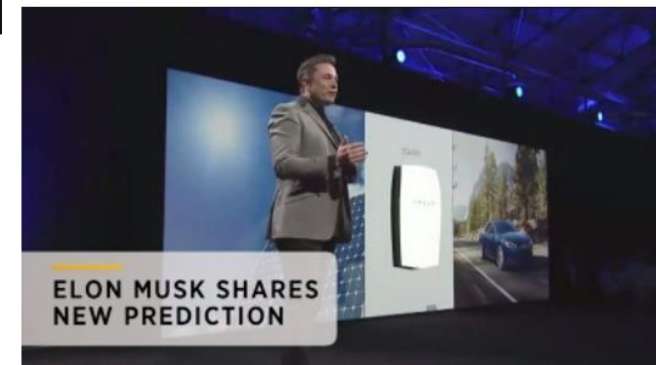
Stephen Hawking: "Humans, who are limited by slow brains, will be superseded"

Elon Musk: Humans must merge with machines or become irrelevant in AI age

Arjun Kharpal | @ArjunKharpal

Published 8:23 AM ET Mon, 13 Feb 2017 | Updated 11:34 AM ET Mon, 13 Feb 2017

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NEW PREDICTION

The economics of algorithmic collusion

Economics of collusion. Two pre-requisites:

- **Stability.** Need the long-term “punishment” to outweigh the short-term benefit of “defecting” from a cartel arrangement and undercutting rivals. Ensures collusion can be rational for each player.
- **Coordination.** But, even if collusion is, in principle, sustainable **need firms to follow the collusive strategy.** Even if it *can* work, distrust/coordination failures often lead to competitive outcome

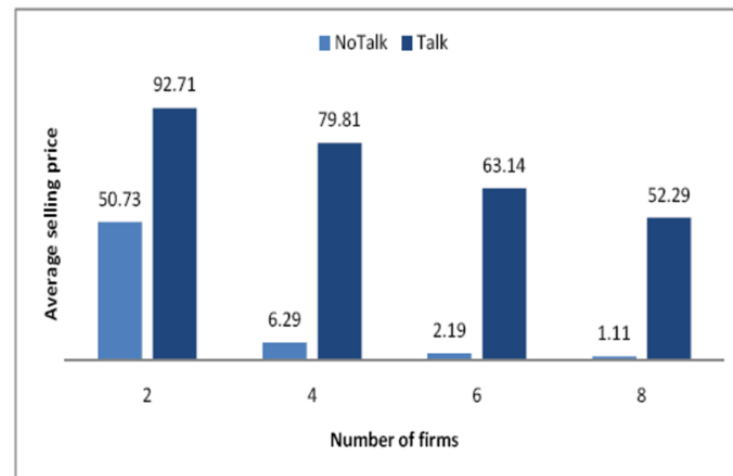
Algorithm concerns focussed on *stability*

- Big data tools allow (almost) perfect monitoring of rivals’ prices
- Makes it easier to determine when a “defection” has occurred
- Dynamic pricing allows punishment to occur more quickly

But the *existence of cartel equilibria* doesn’t mean that they are likely:

- Settling on a collusive outcome requires coordinating on complex dynamic strategies
- Experimental studies find tacit coordination ineffective even in relatively simple settings

Huck (2011) shows that tacit coordination ceases to be effective once there are more than two players



Is there any reason to think algorithms are better at solving these coordination problems?

Communication, coordination and focal points

Frequent communication is the most effective way to achieve cartel outcomes.

- See, e.g. Huck and Normann (2011); Cooper and Kuhn (2014)
- So are algorithms really going to start talking to one another? And is this an enforcement gap?
- Same literature shows important role of social pressures/threats (simply agreeing prices isn't enough). Not clear how hyper-rational algorithms would replicate this aspect

Absent communication, need players to find a focal point

- Very hard given multi-dimensional nature of competition. But, seems intuitive that human sales teams with shared experiences would have the edge over algos trained on narrow data
- An example of importance of coordination over incentive compatibility is prevalence of cartels in dying industries (e.g. cathode ray tubes)
- Dying industries make incentive compatibility harder (knowing there is an “end date” should prevent effective punishment and cause agreements to unravel).
- But, intuitively humans may find it easier/more tempting to collude when their jobs are on the line

Overall:

- Debate based on too many false assumptions. Risks of unintended consequences for innovation
- Authorities should think very carefully before making this an enforcement priority

London

Tel +44 (0)20 7664 3700
8 Finsbury Circus
London EC2M 7EA
United Kingdom

Brussels

Tel +32 (0)2 627 1400
143 Avenue Louise
B-1050 Brussels
Belgium

Munich

Tel +49 89 20 18 36 36 0
Palais Leopold,
Leopoldstraße 8-12
80802 München
Germany

Paris

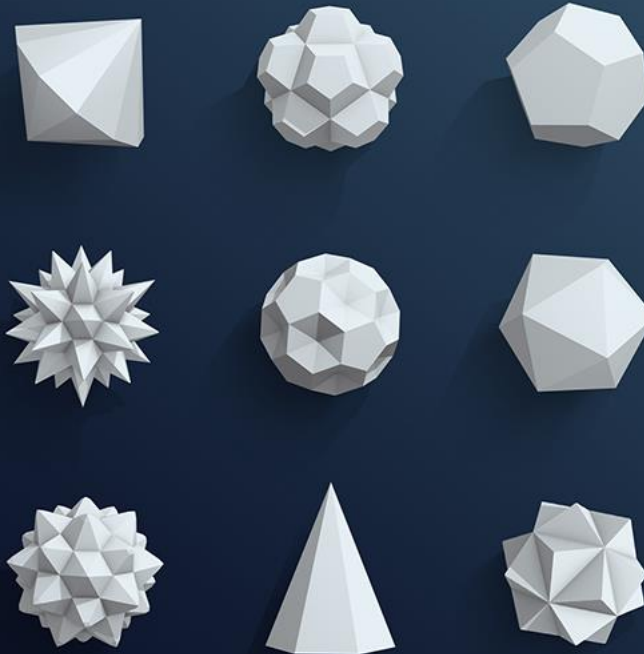
Tel +33 (0)1 70 38 52 78
27 Avenue de l'Opéra
75001 Paris
France

Lyon

Tel +33 1 70 38 52 78
3 place Giovanni Da Verrazzano
69009 Lyon
France

Sydney

Tel +61 (0)406 820 214
Level 22, Tower 2
101 Grafton Street
Bondi Junction NSW 2022
Australia



www.crai.com/ecp

Dr Cristina Caffarra

CRA Charles River
Associates