# O Futuro está Nebuloso: Contaminated and Cosmopolitan Imaginaries in Brazilian AI research

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**Abstract** *This chapter explores the intersection of cosmopolitanism and technological development within the Brazilian AI research community, focusing on the Center for Artificial Intelligence (C4AI) in São Paulo. By conducting an ethnographic study, including interviews with key researchers, this research delves into the sociotechnical imaginaries that shape the development of "Brazilian AI". Amidst the global competition dominated by antagonistic nation-states and monopolistic tech corporations, Brazilian AI researchers occupy a unique position. The study reveals a distinct form of compulsory cosmopolitanism (Appadurai, 2013) that emerges from the (perceived and factual) peripheral status of Brazilian AI research in the global field. Researchers at the C4AI articulate visions of technology that seek to address local and global challenges, reflecting a critical engagement with the dominant technological paradigms and the geopolitical dynamics of AI development. This provincialized form of a sociotechnical imagination, contaminated (Tsing, 2015) and influenced by Brazil's socio-political context and historical coloniality, challenges techno-optimistic narratives of technological progress, highlighting the aspirations and struggles of Brazilian researchers to contribute meaningful AI advancements. These advancements are not merely technological feats but are imbued with the hope of addressing pressing societal issues such as poverty, inequality, and environmental degradation. By analyzing visions of AI development that are deeply influenced by the "realidade brasileira", this study aims to contribute to a critical understanding of tech-cosmopolitanisms in the postdigital age.*

## 1. Algorithmic Cosmopolitanism in a World of Antagonistic Nation States

In *The Everyday Life of an Algorithm*, Daniel Neyland (2019: 3) appears alarmed about the increasing power and agency of algorithms "in making decisions over our futures, decisions over which we have no control". While he is referring to the sociological context of the everyday, the so-called "algorithmic drama" (Neyland, 2019) is

paralleled by questions of global power politics, as Kai Fu Lee (2018) outlines in his book *AI Superpowers*. Here, the development of powerful artificial intelligence (AI) becomes the decisive factor in the geopolitical striving for technological hegemony, fought out between the United States and China. All other actors are relegated to the role of inconsequential bystanders or, at most, mere chaperones. The shaping of AI's future unfolds elsewhere.

While these narratives feed on a dystopian momentum and highlight negative aspects of technology in a globalized world of "antagonistic nation-states" (Szerszynski & Urry, 2002: 461) other authors try to shed light on the connecting qualities of digital technology and media. In *Rewire*, Zuckerman (2013) describes how unlikely opportunities for encounters through the internet could lead to new global lines of connection. William E. Connolly (2000: 614) argues in favour of a "plural matrix of cosmopolitanism", which is informed and driven by digital transnational structures – like the internet – which accelerate speed and enable new forms of cosmopolitan sociality. Evan Elkins (2019) uses the concept of "algorithmic cosmopolitanism", to describe the role of streaming platforms in constituting global habits of watching and listening. Here, algorithms and AI systems are promoted "as engines of multiculturalism" (Elkins, 2019: 384), bringing together people all over the world, crossing all national borders and boundaries. From this standpoint, it seems that a type of cosmopolitanism is already intricately woven into the fabric of AI technology.

However, whether algorithms unite or rather divide the world is not my direct concern in this text. Instead, I aim to delve into the fragmented imaginative construct of a particular type of cosmopolitanism as it manifests itself at the foundation of technology development. Moreover, as I do not wish to replicate the dominant narrative centred on the United States or China, I seek to shed light on a cosmopolitan imaginary as it appears within a specific country often overshadowed in the discourse surrounding AI: Brazil.

I spent three months at the Center for Artificial Intelligence (C4AI) in São Paulo and spoke to researchers there who are trying to make "Brazilian AI", as one of the researchers framed it. The researchers have a unique view of the world and technology development, which may tell us something about the possible cosmopolitan implications of AI. Also, the self-positioning of the researchers and their visions of the future strike me as counter-narratives to the classic Western story of ongoing (technological) progress as a linear, predestined progression from point A to B. Appadurai (2013: 223) identifies this teleological belief as the "meta-trap" of the West and calls it "trajectorism". Appadurai (2013: 225) further highlights that a certain universal ideal of 'cosmopolitanism' participates in a Eurocentric meta-narrative, supporting and perpetuating the ideologies underlying imperialism and global capitalism.

In contrast, the particular cosmopolitanism on display at the C4AI can be understood as a form of "vernacular" or "compulsory" cosmopolitanism, as will later be discussed. The results presented here are a first attempt to make sense of the AI lab-

oratory and the stories told by the AI researchers. The following questions guided the research: Which sociotechnical imaginaries (Jasanoff & Kim, 2013, 2015) converge at this C(enter)-4AI outside of the supposed bi-polar centres? How do the researchers of the C4AI position themselves and how do they imagine the future of AI and their societies? And how are the polarized and globalized positions of the broader AI discourse re-narrated and re-imagined?

The perspective of a genuine "realidade brasileira" [Brazilian reality; all translations by the author, except where stated] and the AI imaginaries that are negotiated by my interviewees could represent a counter-narrative to the powerful centralization discourse surrounding AI, that may lead to a deconstruction or at least a questioning of a dominant "Western" future imaginary. While the future was described as nebulous, the AI researchers at the C4AI also sketched visions of futures in which technology helps to eradicate hunger and poverty.

However, these futuristic imaginaries did indeed not so much entail grand cyber-utopian notions (see Turner, 2006, or Featherstone & Burrows, 1995) but are, rather, informed by a problem-ridden *Gegenwart* or present, leading to more humble visions and seeks to find smaller technical solutions to existential problems. Here, cyber-utopianism (Zuckerman 2013) appears reformulated and transcended in a postdigital (Peters & Besley, 2019; Cramer, 2015) imaginary. Those existential future imaginaries can further be interpreted as a consequence of coloniality (Quijano, 1992, 2007) and a positioning at the periphery or border of tech development in the world.

Before I present and discuss the results of my field research at the C4AI, the concept of cosmopolitanism will be operationalized via the lens of postmodern critique.

## 2. Cosmopolitanism

### 2.1 Mapping the Cosmopolitan Landscape: From Universal Concept to Postcolonial Perspective

Sandra Ponzanesi (2020: 2) depicts cosmopolitanism "as a universalism of a specifically Western concept". Consequently, to examine the concept in depth, many authors go back to the Stoics (Pollock, 2002: 25; Appiah, 2006: xiv), begin their explorations with Immanuel Kant (McCarthy, 1999; Cheah, 2006a; Lindell, 2014: 6; Beck & Sznaider, 2006: 9), or – in a non-Eurocentric attempt – identify early cosmopolitanism in the thoughts of Confucius (Park & Han, 2014). I will not go that far, but will rather try to operationalize the distinction between a more traditional, philosophical conceptualization and a view on cosmopolitanism which is informed by postcolonial critique and emphasizes the procedural nature of the concept.

In a traditional vein, cosmopolitanism can be described as a normative position or philosophy (Van Hooft, 2014), which advocates a global perspective on ethics and moral responsibility. It propagates the ideal that all individuals, regardless of nationality or cultural background, share a common humanity and should therefore be treated with equal dignity and respect. Cosmopolitanism encourages people to think and act beyond the nation (Cheah & Robbins, 1998) and embraces a broader sense of belonging to a global community (Lindell, 2014: 10).

As a sort of "progressive humanistic ideal" (Skrbis et al., 2004: 116), cosmopolitanism is deeply linked to the concept of global citizenship (Mansouri et al., 2017), favouring a legalistic standpoint of rights and responsibilities. For others, it foremost means "being a citizen of the world" (Appiah, 2006: xv), with emphasis on a sense of belonging. However, in Kwame Appiah's (2006: xv) perspective, cosmopolitanism unites two partly conflicting features: on the one hand, a "universal concern" with all people, and on the other hand, respect for "legitimate difference" – be it cultural, social, political or class.

Appiah is interested in the tension that arises in the twilight zone of lived cosmopolitan practice, when the universalist claim of the traditional cosmopolitan worldview collides with particular realities. He is not alone with that observation. Idealized cosmopolitanism may present "a picture that is too neat and celebratory", as Hensby and O'Byrne (2012) put it, and has therefore increasingly attracted postmodern critique and revision, or as Pollock et al. (2002: 11) phrase it with regard to the Kantian philosophical base of cosmopolitanism: "Postcolonial Africa is off the cosmopolitan map for Kant".

In a similar vein, Ponzanesi (2020: 1) emphasizes the onto-epistemological background of Kantian cosmopolitanism, which, in its further development originating in the West (McCarthy, 1999) and finding its way into other regions of the world, was characterized by a "complicity between cosmopolitanism and colonialism" and promoted a form of Western liberal universalism. Robbins and Horta (2017: 4) are more careful in their assessment of the linkage between cosmopolitanism and colonialism, but they also admit that "there has probably never been a cosmopolitanism that did not have colonialism lurking somewhere in the vicinity." Indeed, drawing on Ferri's (2022) broadening postcolonial perspective, it can be argued that this observation applies not only to the concept of cosmopolitanism but also to the entirety of Western philosophy and science.

Correspondingly, Mignolo (2002: 159) develops an argument from the perspective of contemporary coloniality (Quijano, 1992), introducing "critical cosmopolitanism." Here, cosmopolitanism needs to be addressed as both, "a set of projects toward planetary conviviality" (Mignolo, 2002: 157), and also as a storage imaginary for an implicit Eurocentric "imaginary of modernity" (Mignolo, 2002: 162). Mignolo (2002: 177) outlines in three stages the evolution of cosmopolitanism as an epistemological method to grasp the world since the 16$^{th}$ century. Starting with

Christianity's "global project'" of missionization, through centuries of colonial and European history, and culminating in the dynamics of the Cold War, he explains how cosmopolitanism adapted its epistemological parameters and categories of inclusion and exclusion, yet maintained its universalistic premise despite these changes. Cosmopolitanism, Mignolo (2002: 177) concludes, was a political, elite, and Eurocentric endeavour, but always also allowed a variety of different imaginaries of planetary conviviality. Thus, he pleads for a new epistemology of "border thinking", to now include the perspectives of people in subaltern positions, whose lives are often characterized by visible and invisible borders.

Neither Mignolo nor Ponzanesi wish to completely deconstruct cosmopolitanism or replace it with other concepts. However, they advocate a critical examination of the real effects of a cosmopolitan worldview that recognizes the foreign as a valuable resource but cannot leave it in its foreignness and therefore ideologically classifies it and embeds it in a capitalist-colonialist ideology. Rather, critical cosmopolitanism is concerned with examining the diverse modes and manifestations of an imaginary directed towards the world as a whole, taking seriously the fact that the universal character of world assumptions and images of humanity are tested, dissolved or asserted in the tension of glocal assemblages.

## 2.2 Compulsory Cosmopolitanism

For Delanty (2009: 67), cosmopolitanism can be seen and observed in fields of tension "between the global and the local, on the one side, and on the other the universal and the particular." In these tense situations (see also Delanty in this collection), Delanty (2009: 27) identifies "moments of openness", in which people may develop new relations between themselves, others and the world. These open moments may appear when and wherever, and the "cosmopolitan imagination" then occurs thanks to the hybrid and intercultural nature of the encounter. This said, not all intercultural encounters are indeed cosmopolitan – but the cosmopolitan imagination can be characterized as a potentially positive outcome of a conflictual, tense (inter)cultural encounter, which points beyond itself to (universal) commonalities (Delanty, 2009: 27; Hannerz, 1990: 239). Speaking with Blommaert (2017: 44), the cosmopolitan imagination could be seen as one reaction and part of "vernacular globalization" meaning that "global forces are being enacted and turned into locally performed meaning".

The distinction made by Beck and Sznaider (2006: 6) between "cosmopolitanism as normative principles and (actually existing) *cosmopolitanisation* [emphasis in original]" is helpful in highlighting the role of socio-cultural contexts and performativity. Beck (2002: 28) describes the routine, day-to-day process of gradual, often inadvertent cosmopolitanization as "banal cosmopolitanism", exemplified by activities such as watching television, listening to "pop and rave", or eating foreign food.

Conversely, Woodward and Emontspool (2018: 11) refer to it, perhaps with greater precision, as "consumer cosmopolitanism".

While a normative cosmopolitanism may, for example, include the de-construction of "antagonistic nation-states" (Szerszynski & Urry, 2002: 461), the banal "cosmopolitanization of reality" may still be surrounded by enduring national symbolism, categories and narratives (Beck & Sznaider, 2006: 8). In Cheah's postcolonial assessment (2006b: 104), the nation-state may even play a crucial role in critical cosmopolitanization, functioning as a basic condition for the advancement of progressive global-local networks in the South.

Thus, the conception of cosmopolitanization draws attention to the often coerced or unconscious character of multifaceted cosmopolitan engagements. This "cosmopolitanism from below" (Robbins, 2017: 42) or "compulsory cosmopolitanism" (Appadurai, 2013: 213) imagines the individual as exposed to diverse cultural influences from around the world and compelled to navigate and negotiate these new and sometimes conflicting cosmopolitan spaces. This experience of a "compulsory cosmopolitanism" is indeed not a choice but a result of the globalizing forces that shape contemporary life. Cosmopolitanism, writes David Hollinger (2017: 92), "recognizes that there are fewer places to hide from forces that operate in a global arena."

On the negative side, this exposure can generate feelings of dislocation, cultural loss, and anxiety as individuals struggle to maintain a sense of identity and belonging in the face of ubiquitous global influences.

On the other hand, "compulsory cosmopolitanism [can become] a vital source of energy […]" (Appadurai, 2013: 213). To gain a positive momentum, Appadurai (2013: 213) links cosmopolitanism to the ability of "imagining possibilities […] rather than giving in to the probabilities of externally imposed change." For Appadurai, a cosmopolitan mindset is characterized by its ability to create and think in global connections, to appreciate the interconnectedness and to work with it, even if one's own position in the world is characterized by relative powerlessness.

The changeability and disputability of cosmopolitanism demonstrates that we are now no longer dealing with an "ideal and a privilege of the West but a travelling concept" (Ponzanesi, 2020: 1), which may change its concrete meaning in different fields of practice. This is why Pollock et al. (2002: 577) and Kendall et al. (2009) write that one should actually speak of "cosmopolitanisms" in the plural – even though this may contradict the universal character at the core of it as holistic philosophy. But cosmopolitanism "is a lived experience, and one that does not necessarily shy away from particular, local forms" (Skrbis et al., 2004: 123). Lenehan and Lietz (2023), for example, dive deeply into Twitter (now X) and follow traces of a particular digital "cosmopolitan Europeanism", while Assaf and Pagès-El Karoui (2021) sketch the outlines of a vernacular cosmopolitan movement in the Gulf region. Delanty (2009:

67) indicates that these "new conception[s] of cosmopolitanism" are more aptly captured by the notion of "post-universal cosmopolitanism".

Such post-universal cosmopolitanisms may be found anywhere. In his concept of "cosmopolitan contamination", Appiah (2006: 112) draws attention to the myriad cultural possibilities of feeling, (re)acting and speaking in the many fields of glocal tension. Quoting Salman Rushdie, Appiah describes it as a problematic site, as "[m]elange, hotchpotch, a bit of this and a bit of that" (Appiah, 2006: 112). How a person positions themselves in this "mess" is both culturally dependent and indeterminate.

While Appiah (2006: 112) uses the term "contaminators" simultaneously for the first stoics and cosmopolitans, Anna Tsing (2012, 2015) sees in contamination a fundamental principle of global conviviality. Tsing (2012: 95) uses the term "contaminated diversity" to describe cultural and biological ways of life, which emerge "as the detritus of environmental destruction, imperial conquest, profit making, racism, and authoritarian rule – as well as creative becoming" (Tsing, 2012: 95). For Tsing (2012: 96), every human being already lives in "cosmopolitan kinship with the rest of us", whether we want to or not, connected by natural landscapes, biological processes, cultures, trade and digitality. Further building on Lenehan's (2022: 15) discussion of the "postdigital", it is important to add that the dichotomous distinction between the material world and the digital has long been blurred and "both spheres have become inseparable". Through a postdigital lens, the messy, entangled and complex "web of various cosmopolitanisms" permeate the material, the social and the digital, which Lenehan (2022: 15) depicts as a "labyrinth of postdigital cosmopolitanisms".

Echoing this sentiment of inseparable and intertwined entanglements, Tsing (2015: 27) writes: "We are contaminated by our encounters; everyone carries a history of contamination – purity is not an option." Therefore, every postdigital cosmopolitan narrative is also a contaminated narrative.

I will further follow the notion that cosmopolitanism may not be imagined as a pure essence or ideal (Skrbis et al., 2004: 121), but shows itself in forms of multiple cosmopolitanizations and as a contaminated narrative and imaginative practice. On an initial stage, cosmopolitanization is a narrative act of positioning oneself in contexts that are somehow necessarily at an intersection of local and global flows, because as Beck (2002: 30) formulates it, possible cosmopolitanisms can only show themselves glocally. This act of positioning is one important part of cosmopolitanization, as it reveals an understanding of the world and one's own and others' position in it.

But, as Pollock et al. (2002: 8) put it, "cosmopolitanism seeks to take the large view". Therefore, on a second, interconnected stage, cosmopolitanization then lives from developing common imaginaries or theories of conviviality. The sole positioning in and feeling of belonging to a global community is not enough, I would argue,

but cosmopolitanization also longs for a somehow active formulation and imagination of living together in solidarity.

This applies all the more to a world that appears to be networked by digital technologies and references in far-reaching structures that enable virtual (simultaneous) temporalities and spaces. The possibility of digital connection alone, as Zuckerman (2013) demonstrates in *Rewire*, is not sufficient to really develop a cosmopolitan outlook. Shaw (2017) adds to this discussion with his thoughts on Solidarity by Connectivity, fearing that "digital cosmopolitanism" may just be a modern myth in the light of hate speech and filter bubbles. The real question is how people relate to each other in meaningful ways beyond fixed stereotypes, filter bubbles or digitized conflict. The implemented algorithmic systems and AI tools that underscore or surpass them, often carry hidden biases, assumptions and decision criteria that are difficult to understand and can even lead to discriminatory behaviour. This makes it all the more important to take a close look at where and by whom these AI systems are being developed.

This also means that a qualified statement about certain (postdigital) cosmopolitanisms must be grounded in their proper reality. Lindell (2014: 3) goes even further and writes that "cosmopolitanism becomes meaningless without being anchored in empirical reality." He favours an approach that works at the intersection of theory and empiricism (Lindell, 2014: 10), while Skrbis et al. (2004: 121) add that "the fluidity and complexity of cosmopolitanism are only likely to be revealed by the empirical study of its mundane reality."

## 2.3 A Scenery of Mundane Reality: Brazilian AI Research

This brings me back to my field of research. The researchers at C4AI find themselves at a specifically glocal juncture and (maybe not so) mundane reality: As a Brazilian research institute, the C4AI is integrated into the local research agendas of the state of Brazil, the federal state of São Paulo and the university, as well as the requirements of the international sponsor IBM. The material conditions, above all the hardware such as the supercomputers, but also the software and code bases, originate for the most part from U.S. productions. The researchers themselves at the C4AI have globalized biographies, with study or research stays in Europe, Canada, Japan and the USA. As already indicated, the floating AI discourse is polarized between the USA and China, with Europe being predominantly criticized but also acknowledged for its association with legal constraints.

How do the researchers position themselves in this specific environment? How do they see themselves and their research on AI? How do their perspectives influence their outlook on the world and the progression of AI within it? Lastly, what can this narrative approach reveal about the cosmopolitan ideals circulating within the domain of AI development?

## 3. Methodology

### 3.1 The Center for Artificial Intelligence (C4AI)

The Center for Artificial Intelligence (C4AI) is a research centre that focuses on the field of AI and its applications. It was established in 2020 with a significant grant from IBM and FAPESP (the São Paulo Research Foundation) at the Universidade de São Paulo (USP) and works in partnership with other institutions such as the Instituto Tecnológico de Aeronáutica (ITA), the Pontifícia Universidade Católica de São Paulo (PUC-SP), and the Faculty of Industrial Engineering (FEI). The centre aims to conduct "cutting-edge research" in the field of AI, with the goal of contributing to the development of new technologies and the use of AI in various domains, such as industry, healthcare, and education. Additionally, the C4AI seeks to contribute to the training of human resources in the field of AI, and to foster partnerships between academia, industry, and society. In its vision statement it aspires "to be[come] a world-class center of excellence in Artificial Intelligence" (C4AI, 2023).

The C4AI (2023) has currently around 250 researchers and employees, including faculty, post-docs, graduate and undergraduate students. During my research stay from July to October 2022, the C4AI was organized into five sections, each further subdivided into different project groups.

### 3.2 Ethnographic Strategy

While developing the ethnographic strategy (Neyland, 2007: 14), I decided to primarily address two methodologies. The first methodological approach I found to be useful is organization ethnography (Atkinson et al., 2007), which, with its focus on organizational form, work structures, and the everyday (working) life (van der Waal, 2009), may provide a broad as well as thorough view of the C4AI as an organization. I also wanted to shed light on the sociotechnical imaginaries regarding artificial intelligence which may be seen as floating around in the C4AI.

Thus, by classifying the C4AI as an AI research laboratory, the additional perspective of "laboratory ethnography" according to Latour and Woolgar (1979) or Rheinberger (1993) was deemed suitable. Here, the focus lies more on processes of knowledge generation or construction (Knorr-Cetina, 1981), on questions such as: How does AI actually "come into being" or is created? How are the researchers constructing, talking, and interfering with (or around) the technology? The "epistemische Ding" (epistemic thing, Rheinberger 1993) "AI" thus moves to the centre of the ethnographic interest. To address both the character of the C4AI as an organization and its qualities as an AI lab, John Law's (2004) assessment of the indefiniteness or messiness of places, circumstances, and therefore suitable methods, provided a reassuring guardrail during my stay in the field. While characterizing the C4AI in

concrete terms remains difficult, it is certainly a hybrid form of university research institution and privately financed laboratory.

Over the course of these three months I took field notes, observed programmers and researchers while they worked on projects, often typing code, or looking at graphs. I participated in work meetings, drank the typical cup of coffee in the hallway – an ethnographic classic (Latour & Woolgar, 1979: 19) – talked to people casually and conducted 17 narrative, ethnographic interviews (Heyl, 2001; Spradley, 1979). In this paper, I will follow Bryant and Knights' (2019: 19) methodological indications, who see the identification of orientating social imaginaries and narratives as a possibility for gaining an "ethnographical hold" on technological futures in the making.

In the following, I concentrate on eight of those interviews. Of the interviews five were conducted on-site, and three were conducted via an online video conference provider, as many researchers associated with the C4AI often work remotely. While all of the interviews initially started in Portuguese, me or the interviewees sometimes switched to English during the course of the interview for better comprehension. The (originally Portuguese) extracts from the interviews used in this text have all been translated into English.

The (anonymized) names of my interviewees are Paula, Pedro, Michael, Daniel, Ismael, Carla, Robert, Sandra. As my interviewees are important figures in their respective projects, it is argued that their ideas, visions, and leadership strongly influence the organization as well as the development of the AI research at the C4AI.

After transcribing the interviews, I conducted a qualitative content analysis (Mayring, 2014). In the following, I will focus on two main categories that emerged from the material: firstly, the self-positioning of the researchers and the C4AI in the realm of global forces, and secondly a certain related non-imagining of futures. Together, both categories point towards a unique compulsory (Appadurai, 2013: 213) cosmopolitan disposition.

## 4. Results: Positionality and Non-Imagining of Futures

In the following presentation of results, I have deliberately included long and barely edited passages from the transcripts. This is intended to achieve two effects: On the one hand, I want to give as much space as possible to the direct statements of the actors, and on the other hand, it opens a space for dialogue that allows the readers to interact with the statements and come up with their own interpretations, assumptions and questions. My interpretations offered afterwards may and should be critically examined, questioned and reinterpreted. With this in mind, I present a first quote from Paula, a senior researcher at the C4AI and part of the KEML group, who proved to be one of my most important interlocutors.

## 4.1 Positionality: Somewhere at the Periphery

When I asked about Paula's visions of the future, especially regarding technological development, she initially responded with an interesting global positioning:

> "It is not enough time [to compete in every field of AI]! So, let's see what the ability is, the possibility for us to really dominate this technology in the future, to be like: this is us [i.e. the C4AI, or Brazil]. So that we can see how we can take Brazil to a good place within this whole eco-system. But we know it is not easy. Because you saw: China invested, invested heavily. And as the type of power, the type of regime they have there, they have a greater control, right? And they said their goal, while in Germany it was what? 2050? China said 2030. And you can see that if you look at the publishing curves [...] the publishing curves are growing exponentially, the Chinese are growing exponentially!" (Paula)

In this excerpt, Paula is not so much speaking about a specific technological innovation but almost immediately referring to certain limitations and power structures in a globalized world: The C4AI will not be able to compete in every aspect of AI development but will have to find its own way or identity as a research facility. Following this, China is brought in as an example of how state investments and plans influence what future developments will look like. In this sense, Paula adds that Germany will also struggle, as China is "growing exponentially". This statement can be complemented by Sandra's assessment, as she does not believe that "Brazil has the money to compete with the United States, China, Japan or Germany." In this context, Michael positions himself, and Brazil, as follows:

> "[W]here I come from it's the third world, ne? The world is thinking that it is the third world, aren't they? Because third, there's a first and a second. In the cold war you had the United States and the Soviet Union, the two worlds, and the third world was never part of them! And Brazil still suffers a little from this."

Michael, Sandra and Paula highlight the precarious situation of their own research activities in comparison with other 'big players' in the world. In doing so, they actively draw a difference between the C4AI in Brazil and other research institutions in the "first world", adding China's special role. This differentiation, however, takes place along established imaginations (and their respective realities) of national borders (Anderson, 1987), reinforcing a quite "banal nationalism" (Billig, 1995: 114). The USA and China stand out the most as comparative dimensions in the interviews, followed by Japan and Germany. Interestingly, the cultural proximity of Brazil to the USA, at least when it comes to pop-cultural products, is mentioned by both Michael and Daniel, and Robert mentions two other researchers at the C4AI whom he depicts as very influenced by "the American way" of doing things.

A look at the (academic) biographies of my interlocutors reveals a certain international mobility, directed towards the "West". Paula, for example, has spent a number of years in Europe, Michael and Daniel have spent some time in the United States, and Robert and Carla frequently travel to Canada and Australia for conferences and research cooperations. They are embedded in and travel alongside a global AI development community and try to engage with researchers worldwide.

At this point, I want to highlight the narrative position of the interviewed researchers: They present and consider themselves as belonging to the periphery of a global structure, that consists of powerful centres like the United States, China or Europe and a peripheral rest, called the "third world". The interviewees also showed knowledge regarding the colonial past of Brazil, which was in part deemed responsible for the current position of Brazil and its AI research in the world (Michael, Carla).

Taking the accounts of experienced or at least argumentative coloniality seriously, one could argue with Cruz (2021), that the researchers living in the former colonized Brazil still perpetuate "internalized collective understandings [of technological inferiority]", while assigning "the West" the general ability to "solve whatever techno-scientific challenge we might face" (Cruz, 2021: 1851). In this scenario, the researchers of the C4AI naturally orientate themselves towards tech-developments that are made elsewhere. The researchers are, and I am loosely quoting Marcus (1995: 4) here, trying to understand their own present by "borrowing from […] an emergent future", which is (maybe not so) "cautiously imagined" in the West.

While the self-depiction as a somehow deficient "third world" at first seems quite undesirable, the narrative act of distancing the C4AI from the rest of the world also establishes the necessary foundation for creating an own, self-confident research profile and identity.

## 4.2 What about Brazil?

> "Because, in these big AI events there are many panels, there is a lot of discussion. So, there was a specific one on the future of Europe and AI. There is always this question: What about Brazil?" (Sandra)

Sandra's question "What about Brazil?" will further develop my argument and give this paper a new direction. When it came to the role of the C4AI in developing AI technology, Daniel was sure that this "centro brasileiro" will create research that "can only be done here". Sandra puts it this way: "[T]he idea was to become an internationally recognized player in the field of artificial intelligence. A player from South America, a player from the equator downwards […]."

Next to the already cited, most of the other interviewees also expressed self-confident hopes and visions of the C4AI as a research centre that could be on a par with the already established "players" in the world. A strength was seen in the specific

"realidade do Brasil" (Daniel), which shows itself in various forms, be it in the vast amount of available data (Sandra, Robert), the huge size of the country and its "map" (Carla), its unique natural environment (Michael, Robert), a long academic tradition with "top universities" (Ismael) or a certain "culture of curiosity" (Paula) when it comes to new technology.

There was a certain pride with respect to the position of the Brazilian research centre. While mentions of pride referred to certain initial conditions, as soon as I asked about more concrete contours of possible future developments, these statements faded away, became unclear and blurred. Here, too, Paula distinguished herself with a determined response.

## 4.3 Provincial Tech-Futures

> "Today we are seeing that […] the monopolies are getting too big, right? […] We want to see if we can break this paradigm that is leading to the conclusion that there will be only super-powerful machines and huge machines, huge data memories, giant processing power and that [only a few] can control the services and the technologies that can be developed. […] We are trying to break this down". (Paula)

The desire to actively "break" or disrupt the existing paradigm is directed against the monopolies of large tech companies and seeks alternative ways within the C4AI. As an example of how a differently framed tech development might look like, Sandra told me, that:

> "[…] there is much to be done in the development of AI in terms of natural language processing for Portuguese, because it is a fact that much of what we have today in the development of artificial intelligence goes through natural language processing, and if Brazilians or Portuguese are not translating it back into Portuguese, it will not be Americans, Germans or Japanese who will be doing it." (Sandra)

It is true that today's most powerful AI tools, such as the recently introduced ChatGPT (OpenAI 2023), have been trained and developed mainly in English – and therefore also achieve excellent results primarily in this language. When ChatGPT 3.5 and especially 4 was released, I spoke with some of the researchers at the C4AI who indeed were quite surprised by the performance of the AI bot. Carla even compared it to the Sputnik crisis in the 1950s[1]. Similarly, the ChatGPT release demonstrated how advanced U.S. companies already are in comparison to the research at the C4AI. This said, in Carlas' vision the C4AI will try to bridge this gap, bringing Portuguese into AI

1 The so called "Sputnik Shock" (Dickson 2001) refers to the global astonishment triggered by the Soviet Union's launch of Sputnik, the first artificial Earth satellite, in 1957, marking a significant moment in the Cold War space race.

development and therefore "make an AI more Portuguese and Brazilian […] to solve a problem for many other Portuguese-speaking people around the world."

Michael enhances the postcolonial perspective, also touching on the issue of technological lag:

> "The Southern Hemisphere ends up losing a bit of access to this type of [AI] knowledge, models, and solutions. So, there's a lot that is developed in these ["Western"] countries and doesn't reach here, and there are other developments that do arrive, but are not useful because they need adaptations; they don't fit our reality."

Similarly, Robert, thinks "that developed countries […] dictate these technologies, they move forward, they have advantages that we can't reach." However, Robert also identifies a strength in being a research centre in the South, as:

> "[…] we [the C4AI] will have a very big advantage in problems that don't exist there [Europe], for instance. So, in problems that involve the distribution of food in very poor areas, detection of tropical diseases, recovery of areas where nature has been degraded. I think there is a great chance for developing countries to supply this type of technology created for solutions, and in countries that are developing."

In *Whose Global Village? Rethinking How Technology Shapes our World*, Ramesh Srinivasan (2017: 1) points to the "asymmetric diffusion of digital tools and systems" in the world, which are "produced and shaped by powerful corporations and institutions from Europe and North America […]". This assertion is echoed and felt by Robert, Michael, Carla and Sandra.

However, building upon extensive fieldwork, Srinivasan (2017: 209–211) also shows that a collaborative praxis of re-imagining and building technology from the South and by marginalized communities can lead to alternative technology, providing a "provincialized" but likewise "cosmopolitan solution" to problems of subaltern communities worldwide. One may detect a variant of this practice of envisioning "provincialized" or "decolonial tech-futures" (Cruz, 2021) in the statements made by Paula, Sandra, and Robert; whether it's through developing a Portuguese AI, adapting Western technology to the Brazilian context, or creating AI solutions tailored to the unique challenges faced by poorer countries in the Southern Hemisphere.

## 4.4 The Non-Imagining of Futures

Notably, active and positive projections or visions stand quite alone in the research data. Most interviewees said they would not like to talk about the future or admitted that "it's very difficult […] to imagine futures differently" (Robert). Often, they articulated future visions that are a "continuation of what was already happening"

(Daniel), hoping that "we do better than what we have already done. We want 5G internet, we'll wait for 6G, even faster" (Pedro). Carla's statement regarding the "ChatGPT shock" also revealed a certain perplexity in view of the superiority of U.S. AI development. Also, Carla admitted, they will surely try to make use of the GPT 4 frame for their own research.

I encountered similar sounding future stories when I undertook research with developers on GitHub (Franco, 2022, 2023), who also expressed techno-scientific imaginaries populated by ever better technology and ripe with pragmatic techno-optimism. In *What Tech Calls Thinking*, Adrian Daub (2020: 90) shows that the "tech sector takes pleasure in a weak utopianism of results", which envisions "giving everyone a self-driving car or putting a man on Mars. Or in bringing customers a burrito in less than thirty minutes."

But other than this typical "mundane optimism"-imaginary of the Californian tech-elites (Barbrook & Cameron, 2015 [1996]: 4), the mundanity or "weak utopianism" (Daub, 2020: 90) of the tech-visions articulated by my interviewees at the C4AI have a divergent structure and different baseline:

> "So, I have this social responsibility. […] To achieve equality. And technology is – we will not be able to do so many amazing things, how the people like to think, if we do not look for these very basic needs. I don't think that we can just forget about a big part of our population that has almost nothing to eat." (Ismael)

Instead of achieving the goal of delivering a burrito even faster, the main concern of Ismael is to establish food security in the first place in a country that only recently returned to the United Nations (UN) Hunger Map[2] (Guedes, 2022). In the interviews, the extreme social inequality in Brazil was addressed and the development of AI systems was subordinated to the goal of reducing poverty (Michael, Pedro), malnutrition (Ismael) and social injustice (Paula, Daniel). In fact, more elaborated technological utopias (like self-driving cars, internet of things, etc.) did not appear in the data, instead Michael just hopes that "[the future] won't be a complete dystopia." Michael also said that the C4AI should primarily focus on small and effective fixes, instead of ground-breaking innovations. He called this tendency to look for small solutions to mitigate the worst consequences "dar um jeitinho" – loosely translatable with "finding a small solution". This specific method of finding a way to accomplish something

2 The UN Hunger Map is an interactive tool developed by the United Nations World Food Programme (WFP). It visually represents global hunger and food insecurity data, allowing users to understand the scale and distribution of hunger worldwide. The map highlights regions facing food scarcity challenges, aiming to raise awareness, inform policy decisions, and guide humanitarian aid and development efforts to alleviate hunger and improve food security. For more information see: https://hungermap.wfp.org/.

by bending or sidestepping known ways or even breaking social conventions was recognized by the historian and sociologist Sérgio Buarque de Holanda (2012 [1936]) as a typical Brazilian practice in his book *Raízes do Brasil* (Roots of Brazil). This stereotypical depiction of a Brazilian approach to dealing with problems of the future is used by Michael in an act of positive self-identification: As a Brazilian researcher, he may come up with a working code system or AI structure that follows the principle of "dar um jeito".

Finally, Paula pointed out that the typical "americano" likes to state "[that] in ten years we will have this! […] We discover everything! I don't have this character trait. […] I don't like to talk about the future." In this direct rejection of the Californian "mundane optimism" and of the praxis of utopian tech-imagining one may detect another cautious indication for a vernacular practice of cosmopolitan imagination, which is not directed towards grand universal solutions, but tries to think from the borders, from the South, and to work towards common basic future needs. Srinivasan's (2017) concept of "provincialized" technological imaginations, leading to cosmopolitan solutions, is fitting to describe this particular praxis of post-universal cosmopolitan imagination at the C4AI.

It is precisely this "non-imagining" or reduced imagining of jeitinho solutions which draws a line between the C4AI as a (Brazilian) research laboratory and a dominant discourse around AI which is deeply influenced by vivid imaginaries of technological optimism and utopias.

## 5. Nebulous Futures and Contaminated Cosmopolitanism

The narrated positionalities as well as the dependent future imaginaries of the researchers reveal a certain global, post-colonial nexus, which is primarily characterized by power inequalities and non-predictable futures. Be it by framing oneself as "third world" or by thematizing the difficult economic and social developments in Brazil, the interviewees showed great awareness regarding global and domestic power inequalities and did engage in questions of universal concern.

Out of this precarious positionality, active and positive future imaginaries were hard to find. Paula shed light onto this constellation by admitting:

> "The future is very nebulous because there are these forces that are dominating. […] Nowadays we don't see much of this light at the end of the tunnel, ne? It's very foggy." (Paula)

This nebulous or foggy future could be interpreted as a logical result of the previously introduced "open moment" (Delanty, 2009) and the "compulsory cosmopolitanism" (Appadurai, 2013), that arises in the glocal tension at the C4AI. When the past is char-

acterized by a lack of power and the present is seen as a continuance of this precarious situation, it may be difficult to actively formulate a clearly positive future. In the non-imagining and the formulation of a nebulous future the negative aspects of the "cosmopolitan kinship" (Tsing, 2012) can be identified, meaning a feeling of dislocation, cultural loss, and anxiety. The "forces that operate in a global arena" (Hollinger, 2017: 92) are directly addressed by Paula and may seem overwhelming, the important developments in AI are made elsewhere.

The narratives show themselves as contaminated by a global externality (like the ChatGPT Shock) and coloniality (technologically, economically, culturally, intellectually in form of patents, innovations, etc.). One's own power to act was accordingly perceived to be low. This leads either to "non-imagining" of futures or a tendency towards a pessimistic view of a nebulous future.

However, in these situations also lies the potential to resist the pull of solutions originating from a hegemonic world. The projected "breaking" of the monopolistic tech-world indicates a certain self-confidence in this regard. While the West (especially the USA and Europe) as well as China were used as comparative backgrounds, in the light of which Brazilian AI research will have a difficult time, the "realidade brasileira" was addressed by some to argue quite confidently in favour of engaging with technological futures "Made in Brazil".

Initially grounded in banal nationalism, the self-positioning relied on the national category "Brazil", with researchers inclined to position themselves in a narrative counter-positioning against the rest of the world, especially the "West" and China. However, future imaginaries of conviviality also emerged from this foundation. In this sense, the nation state functions as a central condition for the advancement of progressive development in the South, just as Peng Cheah (2006b: 104) proposed it in his postcolonial take on cosmopolitanism. The problem-ridden present serves as a setting and as a stage for a specific practice of envisioning "existential futures", which are forming around existential threads and looking for correspondingly fast or urgent solutions. Those AI-"jeitinhos" are not only thought of as nationalistic solutions, but aim to help the South and the so called "third world" in general. In this case, the compulsory cosmopolitanism may indeed serve as a "vital source of energy" (Appadurai, 2013) to envision future possibilities and technology; that serves the good and may help the disenfranchized and subaltern (Srinivasan, 2017).

This said, the source of those technological solutions may again depend on the "West" and its technological products. Doing so carries the risk of onboarding onto the "West as steward discourse of culture in which so-labelled 'non-Western' people are Othered as needing help […]" (Amadasi & Holliday, 2017: 247). In this narrative, the "West" still acts as a role model and illuminates the path to the future. The interviewees' visions of the future therefore oscillated between self-confident formulations of "Brazilian AI" and rather stagnating visions of relative powerlessness.

The analysis of the empirical material displayed a certain vernacular cosmopolitanization from the South, which shows itself concerned with existential threats and "small futures", offering the perspective of a post-utopian cyber-imaginary, while a classical Western tech-cosmopolitanism may still pursue grand solutions and digital utopias.

Indeed, Charles Ess, as early as 2001, highlighted how the discourse surrounding technologies is heavily influenced by a dominant U.S. tech-imaginary, oscillating between utopian futures or dystopian scenarios. Ess (2001) suggests that the content of the utopian tech-imaginary can be linked to a form of tech-cosmopolitanism, encompassing notions of the "global village" (McLuhan, 1964) and leading to the successful promotion of democratic principles. The concept of a small future tech-imaginary doesn't neatly align with the dominant discourse, yet it does reflect the qualities of an "alternative" or even "middle ground" vision, as Ess (2001: 4) described possible local manifestations of tech-cosmopolitanisms in *Culture, Technology, Communication: Towards an Intercultural Global Village*. Lenehan (2022: 20) emphasizes, in light of the dominance of U.S. tech-narratives discussed by Ess (2001), that in contextualized and culturally adaptive use of technology there is always also potential for the creation of "native" or local (post)digital cosmopolitan spaces.

The "small" or "existential" future visions at the C4AI are a consequence of compulsory cosmopolitanism, contaminated with coloniality and precarity, but nevertheless aiming to improve the lives of the people living at the "borders" (Mignolo, 2002).

The geo-historical self-classification as "third world" as well as the developed images of existential futures may refer to the larger discourse of coloniality, but it would be presumptuous and wrong to classify and construct the technologically excellently equipped C4AI and its highly trained researchers as "deficient Other[s]" (Amadasi & Holliday, 2017: 247). Rather, they present a particular C4AI-community of practice that is still in the process of establishing its own identity as an AI laboratory "from the equator downwards". Speaking with Cruz (2021: 1581), tech-development from the South lives from "dreaming and co-constructing […] other possible worlds from the bottom-up." The researchers at the C4AI are indeed dreaming of and experimenting with their own sketches of – sometimes nebulous – techno-sociological AI imaginaries.

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