

Bing Chat and Map Projections

After it became available to the public in November 2022, ChatGPT reached the number of 123 million monthly active users in three months, while, for example, TikTok took nine months to reach the number of 100 million active users. This made ChatGPT the fastest growing consumer technology in history. Such an exponential growth of artificial intelligence was not predicted even by experts who deal with it, predicting that something like this will happen in approximately ten years.

ChatGPT is banned in countries with strong internet censorship, such as North Korea, Iran, Russia and China. There are another 32 countries where it is currently unavailable. Italy was the first western country to temporarily ban it due to a data privacy breach (which OpenAI quickly fixed) and the ban was lifted at the end of April 2023.

Microsoft's Bing Chat became publicly available on March 7, 2023. Unlike ChatGPT, it does not require registration. Its GPT-4 language model is based on Bing data. The most significant difference between ChatGPT and Bing Chat is that the latter has Internet access. Therefore, it is aware of current events, and unlike ChatGPT, it does not ignore events after September 2021. Answers to individual questions contain links to the literature used in the answer (Rudolph et al. 2023). However, it sometimes cites the wrong originals. For example, to the question asked: How can cartography be used with artificial intelligence? he answered:

- 1) Artificial intelligence can help in the analysis and visualization of spatial data, such as satellite images, geographic information systems, digital terrain models, etc.¹
- 2) Artificial intelligence can help in choosing the most appropriate



map projection to display a certain area or topic²

- 3) Artificial intelligence can help in the design and optimization of map signs, symbols, colours and layers for better readability and aesthetics of maps³
- 4) Artificial intelligence can help generate and update maps based on various data sources, such as social networks, sensors, volunteer geographic information, etc.

In citing the original under 1), the link leads to an article in PcChip, but there is no claim made in that article. Under 2) is a Wikipedia article entitled Cartography, but the article does not contain the stated claim. The Artificial Intelligence article in Wikipedia is listed under 3), but the claim is not stated in that article either.

To test his knowledge of map projections, we asked him questions in English about the definition of conic, cylindrical, pseudoconic and pseudocylindrical projections, i.e. the questions we also asked ChatGPT (Frančula, Lapaine 2023).

What are conic projections?

Conic projections are a type of map projection that is derived from projecting the globe onto a cone. The cone is positioned so that it rests on the globe along a standard or selected parallel. The surface features of the globe are then depicted as if projected onto the cone. In flattened form, a conic projection produces a roughly semicircular map with the

area below the apex of the cone at its center¹.

Conic projections are used for midlatitude zones that have an east–west orientation². Somewhat more complex conic projections contact the global surface at two locations. These projections are called Secant projections and are defined by two standard parallels².

What are pseudoconic projections?

A pseudoconic projection is a map projection in which the meridians of the normal aspect are mapped as curves symmetrical about the straight central meridian and parallels as the arcs of concentric circles with the center on the central meridian. There are many different pseudoconic projections. One of them is the Bonne projection¹.

What are cylindrical map projections?

Cylindrical map projections are a type of map projection that involves wrapping a cylinder around the Earth, touching it at the equator or another standard line, and projecting the Earth's surface onto the cylinder. This kind of map projection has straight coordinate lines with horizontal parallels crossing meridians at right angles¹.

Originally, this and other map projections were achieved by a systematic method of drawing the Earth's meridians and latitudes on the flat surface².

What are pseudocylindrical projections?

Pseudocylindrical projections are a type of map projection that are neither cylindrical nor conical. They are called pseudocylindrical because they have straight parallels and curved meridians. The parallels are straight parallel lines, while the meridians are curves¹².

Bing Chat i kartografske projekcije

Nakon što je javnosti postao dostupan u studenom 2022. ChatGPT je u tri mjeseca dostigao broj od 123 milijuna mjesečno aktivnih korisnika, dok je npr. TikToku trebalo devet mjeseci da dostigne broj od 100 milijuna aktivnih korisnika. Time je ChatGPT postao najbrže rastuća potrošačka tehnologija u povijesti. Takav eksponencijalni rast umjetne inteligencije nisu predviđali ni stručnjaci koji se njome bave predviđajući da će se nešto takvo dogoditi za približno deset godina.

ChatGPT je zabranjen u zemljama s jakim internetskom cenzurom, poput Sjeverne Koreje, Irana, Rusije i Kine. Postoje još 32 zemlje u kojima on trenutačno nije dostupan. Italija je bila prva zapadna zemlja koja ga je privremeno zabranila zbog povrede podataka o privatnosti (što je OpenAI brzo popravio) pa je krajem travnja 2023. zabrana ukinuta.

Microsoftov Bing Chat postao je javnosti dostupan 7. ožujka 2023. Za razliku od ChatGPT-a ne zahtijeva registraciju. Njegov je jezični model GPT-4 temelji se na Bingovim podacima. Najznačajnija razlika između ChatGPT-a i Bing Chata je ta što potonji ima pristup internetu. Stoga je svjestan aktualnih događaja, i za razliku od ChatGPT-a, ne zanemaruje događaje nakon rujna 2021. Odgovori na pojedina pitanja sadrže poveznice na literaturu kojom se poslužio u odgovoru (Rudolph i dr. 2023). Međutim, ponekad navodi pogrešne izvornike. Na primjer, na postavljeno pitanje:

Kako se kartografija može koristiti umjetnom inteligencijom?
odgovorio je:

1) Umjetna inteligencija može pomoći u analizi i vizualizaciji prostornih podataka, kao što su satelitske snimke, geografski informacijski sustavi, digitalni modeli terena i sl¹

2) Umjetna inteligencija može pomoći u odabiru najprikladnije kartografske projekcije za prikaz određenog područja ili teme²

3) Umjetna inteligencija može pomoći u dizajnu i optimizaciji kartografskih znakova, simbola, boja i slojeva za bolju čitljivost i estetiku karata³

4) Umjetna inteligencija može pomoći u generiranju i ažuriranju karata na temelju različitih izvora podataka, kao što su društvene mreže, senzori, volonterske geografske informacije i sl.

U citiranju izvornika pod 1) poveznica vodi do članka u PcChipu, ali u tom članku nema navedene tvrdnje. Pod 2) je članak u Wikipediji pod naslovom Kartografija, ali članak ne sadrži navedenu tvrdnju. Članak Umjetna inteligencija u Wikipediji navodi se pod 3), ali ni u tom članku nema navedene tvrdnje.

Da bismo testirali njegovo znanje o kartografskim projekcijama postavili smo mu na engleskom pitanja o definiciji konusnih, cilindričnih, pseudokonusnih i pseudocilindričnih projekcija, tj. pitanja koja smo postavili i ChatGPT-u (Frančula, Lapaine 2023).

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Some examples of pseudocylindrical projections include the Sinusoidal projection, the Mollweide projection, and the Robinson projection²

Glavna zamjerka njegovim odgovorima je što konusne i cilindrične projekcije definira uz pomoć pomoćnih ploha – konusa i cilindra.

We conclude that at this stage of development, Bing Chat is almost unusable for talking about map projections, because when downloading information, it sometimes makes mistakes and refers to fictional literature.

Zaključujemo da je na ovom stupnju razvoja Bing Chat gotovo neupotrebljiv za razgovor o kartografskim projekcijama jer pri preuzimanju informacija ponekad griješi i poziva se na izmišljenu literaturu.

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The main objection to his answers is that he defines conical and cylindrical projections with the help of auxiliary surfaces – cones and cylinders. This is understandable because it is also the case in the literature referred to by links. In the definition of pseudoconical projections, it correctly states the form of the network of meridians and parallels in the normal aspect, while in the definition of pseudocylindrical projections it does not state that it is the form of the network of meridians and parallels in the normal aspect. We therefore also asked him a question about the aspect of projection.

What is the aspect of map projection?

In cartography, a map projection is any of a broad set of transformations employed to represent the curved two-dimensional surface of a globe on a plane. In a map projection, coordinates, often expressed as latitude and longitude, of locations from the surface of the globe are transformed to coordinates on a plane¹.

The aspect of a projection is generally defined in reference to the relationship with the auxiliary surface. However, such surfaces generally do not exist in the theory of cartographic projections, which poses the problem of defining the aspect without defining auxiliary surfaces. This paper

explains how the aspect of a projection can be defined in two ways that are not mutually exclusive. According to the first definition, the aspect is the position of the axis of the projection in relation to the axis of geographic parameterization of the sphere².

In his answer, he emphasizes that the aspect is usually defined by the position of the auxiliary surface, but that such surfaces do not exist in the theory of map projections, so the aspect of the projection must be defined without their help. It gives the correct definition of the aspect of projection by referring to the article of the authors of this text (Lapaine, Frančula 2016).

When we asked the same question the next day (May 2, 2023), we received a different answer.

What is the aspect of map projection?

Map projections can be described in terms of their:

1. class (cylindrical, conical or azimuthal),
2. point of secancy (tangent or secant),
3. aspect (normal, transverse or oblique), and
4. distortion property (equivalent, equidistant or conformal)¹.

The aspect of a map projection refers to its orientation on the page or display screen. If north or south is straight up, the aspect is said to be equatorial; for most projections this is the normal aspect. When the central axis of the developable surface is oriented east-west, the projection's aspect is transverse.

The first part of the answer does not refer to the aspect of projection but to their classification. Under 1) it lists only cylindrical, conic and azimuthal projections, ignoring the others. The answer under 2) includes auxiliary surfaces, although in the previous answer he concluded that such surfaces do not exist in the theory of map projections. The aspect definition, although taken from MathWorks (2023), is unacceptable, inter alia, because it includes auxiliary surfaces. Question to the authors from MathWork: how they will define the aspect of pseudoconic, pseudocylindrical and polyconic projections and, for example, Winkel Triple projection.

In a comparison of the definitions of conic, cylindrical, pseudoconic and pseudocylindrical projections of ChatGPT (Frančula, Lapaine 2023), Bing Chat answers are somewhat shorter, but also with fewer errors.

In the end, we can conclude that at this stage of development, Bing Chat is almost unusable for talking about map projections, because when downloading information, it sometimes makes mistakes and refers to fictional literature. It is likely that these problems will be solved in the near future.

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To je i razumljivo jer je tako i u literaturi na koju se poziva poveznica. U definiciji pseudokonusnih projekcija pravilno navodi oblik mreže meridijana i paralela u normalnom aspektu, dok u definiciji pseudocilindričnih projekcija ne navodi da se radi o obliku mreže meridijana i paralela u normalnom aspektu. Postavili smo mu stoga i pitanje o aspektu projekcije.

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In cartography, a map projection is any of a broad set of transformations employed to represent the curved two-dimensional surface of a globe on a plane. In a map projection, coordinates, often expressed as latitude and longitude, of locations from the surface of the globe are transformed to coordinates on a plane¹.

The aspect of a projection is generally defined in reference to the relationship with the auxiliary surface. However, such surfaces generally do not exist in the theory of cartographic projections, which poses the problem of defining the aspect without defining auxiliary surfaces. This paper explains how the aspect of a projection can be defined in two ways that are not mutually exclusive. According to the first definition, the aspect is the position of the axis of the projection in relation to the axis of geographic parameterization of the sphere². U odgovoru naglašava da se aspekt obično definira položajem pomoćne plohe, ali da takve plohe u teoriji kartografskih projekcija ne postoje pa je aspekt projekcije potrebno definirati bez njihove pomoći. Daje ispravnu definiciju aspekta projekcije pozivajući se na članak potpisnika ovog teksta (Lapaine, Frančula 2016).

Kada smo sljedeći dan (2. 5. 2023) postavili isto pitanje, dobili smo drugačiji odgovor.

What is the aspect of map projection?

Map projections can be described in terms of their:

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2. point of secancy (tangent or secant),
3. aspect (normal, transverse or oblique), and

4. distortion property (equivalent, equidistant or conformal)¹.

The aspect of a map projection refers to its orientation on the page or display screen. If north or south is straight up, the aspect is said to be equatorial; for most projections this is the normal aspect. When the central axis of the developable surface is oriented east-west, the projection's aspect is transverse.

Prvi dio odgovora ne odnosi se na aspekt projekcije već na njihovu klasifikaciju. Pod 1) navodi samo cilindrične, konusne i azimutne projekcije zane-marujući ostale. Odgovor pod 2) uključuje pomoćne plohe, iako je u prethodnom odgovoru zaključio da takve plohe ne postoje u teoriji kartografskih projekcija. Definicija aspekta, iako preuzeta iz MathWorksa (2023), neprihvatljiva je, međuostalim, i stoga što uključuje pomoćne plohe. Pitanje autorima iz MathWorka kako će definirati aspekt pseudokonusnih, pseudocilindričnih i polikonusnih projekcija te npr. Winkelove trostruke projekcije.

U usporedbi definicija konusnih, cilindričnih, pseudokonusnih i pseudocilindričnih projekcija ChatGPT-a (Frančula, Lapaine (2023) odgovori Bing Chata nešto su kraći, ali i s manje pogrešaka.

Na kraju možemo zaključiti da je na ovom stupnju razvoja Bing Chat gotovo neupotrebljiv za razgovor o kartografskim projekcijama jer pri preuzimanju informacija ponekad griješi i poziva se na izmišljenu literaturu. Vjerojatno će se ti problemi u bliskoj budućnosti riješiti.

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