Public Diplomacy and Geovisual Analytics

Mapping China's Panda Diplomacy through Space and Time

A Penn State MGIS Capstone Project

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1. Abstract

In an age where social media, traditional media, and global travel makes it possible for a country to curate its international public perception, understanding how a country approaches its public diplomacy strategy is important for revealing its overall power projection. After all, how a country chooses to publicize its image depends on whom it seeks to influence and why. Fully understanding these motivations and the power intentions of countries is a critical task for geospatial intelligence that can serve to inform decision making in our foreign and national security policies. While the study of public diplomacy is often concerned with modeling intangible concepts such as cultural values and government effectiveness, there are new opportunities to explore the tangible geographic footprint produced from the interactions between countries. In this project I show how spatiotemporal visualization of the geographic footprint of public diplomacy can reveal previously unexplored patterns and relationships between powers. This is explored via a case study of China's practice of so-called Panda Diplomacy over the last twenty years and makes use of Esri's Insights for ArcGIS geovisual analytics platform. The methodology and results of this project demonstrate not only how the discipline of geography can provide the study of public diplomacy a new lens with which to explore complex physical and abstract relationships, but they also show how the geospatial intelligence community can characterize public diplomacy to discover power relationships and explore their geopolitical implications through geovisual analytics.

2. Introduction

A government's international power comes in three main forms: military power, diplomatic power, and soft power. Soft power is the ability to generate sympathy based on the attractiveness of one's national culture, values and policies, and is carried out through the instrument of public diplomacy (Gilboa, 2008). Although effective public diplomacy primarily relies on abstract concepts, digital communication, and carefully curated public perception, a geographic footprint reflecting the cultures involved in these exchanges is also generated. In this project, I demonstrate how analyzing the geographic footprint of public diplomacy with a geovisual analytics approach can reveal previously unexplored relationships. This was accomplished via a case study of China's practice of panda diplomacy and made use of Esri's Insights for ArcGIS analysis environment.

3. Background

Soft power and public diplomacy are relatively new concepts that emerged during the initial years of the Cold War where diplomatic power faltered and military power alone would have destroyed the entire human population. The idea behind public diplomacy was to "provide the public in the target society with more balanced information on one's own country to counter the domestic propaganda of the target society's government" (Gilboa, 2008, p. 59). It has since developed into a way for a government to increase people's familiarity with its country which then subsequently increases the people's appreciation for it (Hartig, 2013). Understanding a country's soft power and public diplomacy strategy can reveal a country's overall power intention. People who deny the "importance of soft power are like people who do not understand the power of seduction" – as soon as it is understood that a soft power seduction is occurring, one can begin asking why (Nye, 2008, p. 96). Academically, public diplomacy is a burgeoning field with research being completed from the perspective of the nation-state using models, theories, and methodologies popular with public relations and international communication studies (Gilboa, 2008). While many academic articles repeatedly relate public diplomacy with geopolitics and a world system, research using geospatial models is not readily apparent even though it is suggested that research on public diplomacy could experience a breakthrough if it was synthesized with other disciplines (Gilboa, 2008). Synthesizing public diplomacy concepts with the discipline of Geography and using geospatial modeling could provide new perspectives and reveal unexplored insights related to soft power.

Although soft power operates within an abstract spectrum through intangible concepts such as political stability, government effectiveness, cultural values, digital diplomacy and policy preferences, public diplomacy also undeniably has a geospatial footprint (Chitty, et al., 2017). After all, each country and many of its actions still physically exists in space on the earth. Following Waldo Tobler's first law of geography which states "everything is related to

everything else, but near things are more related than distant things", new relationships in public diplomacy can be explored within this tangible frame of reference (1970, p. 236). Replace "things" with "countries" in Tobler's law and we can explore how proximity may affect public diplomacy. If nearer countries are more related than farther countries, are they related enough to avoid becoming a public diplomacy target? In addition to a geospatial footprint, public diplomacy also has a temporal timeline: one country engages in public diplomacy with another country for a reason, whether in response, in preparation for, or in tandem to an event. Contextualize "things" with "time" in Tobler's first law and we can now explore how temporal proximity of international relations may affect public diplomacy. If countries interact nearer in time, are they less susceptible to public diplomacy efforts since they are more related? Can this temporal knowledge be used along with a spatial picture to predict a country's global or regional intentions? These are the types of questions that are inspired by analyzing public diplomacy through a geospatial lens.

In order to best answer those questions, the geospatial data analytics model that would provide public diplomacy research the most flexibility, exploration, and synthesis is geovisual analytics. According to Andrienko, et al., geovisual analytics is a research area that seeks to solve "spatial-related decision problems through enhancing human capabilities to analyze, envision, reason, and deliberate" primarily by means of "visualization and interactive visual interferences" (2007, p. 847). Geovisual analytics builds on a lot of the same work previously done in geovisualization. While geovisualization allows one to look at data from multiple perspectives simultaneously in order to stimulate visual thinking about patterns, relationships, and trends, geovisual analytics takes it one step further and focuses on tangible analytical reasoning through the process of "examining information in order to find patterns within that information" (Kraak, 2003; Robinson, 2017). Geovisual analytics has the potential to go beyond current data visualization systems that leave the decision-making and analysis up to the user and additionally allow the user to organize different analytical results into coherent groups for further analysis at a larger scope or to present complex ideas interactively (Amar & Stasko, 2005, Robinson, 2011). Tools such as multiple coordinated map views, diagrams, graphs, photographs, and videos can be synthesized in the same interface and force one to think unconventionally (Kraak, 2003). Inherent in geovisual analytics is its ability to shift perspective using different variables within a dataset. In the case of public diplomacy, while the subject, means, and results of the campaign are of more interest to foreign policy than just the locations, spatially mapping all attributes of the data could provide a new perspective with which to explore non-geographic or intangible attribute relationships.

Regardless of the number of tools available to the analyst, there are shortfalls to geovisual analytics and geovisualization. First, not all events are meaningful at all scales, and geospatial data is often too diverse to map all scales. This means the analyst may be missing key information if they have elected to map at a less meaningful scale or omit datasets entirely

(MacEachren, 2001). Secondly, many geovisual tools are built under a mindset of "one tool fits all" when the focus should have been on creating a tool that can function as a purely analytical and exploratory framework, absent of a predetermined hypothesis (MacEachren, 2001, p. 9). These shortfalls must be considered in order to select and use the geovisual analytic tool that best aligns with the analyst's purpose. If problems and solutions are already known, few scale representations and a generalized geovisual tool may be useful. However, if the purpose is to explore known hypotheses or develop new ones, multiple scale representations and an interactive and exploratory tool will most likely be essential.

In a case study exploring geospatial dimensions of public diplomacy, China's public diplomacy of gifting giant pandas, known as *panda diplomacy*, was analyzed through the use of geovisual analytics. Considering China's "greatest strategic threat today is its national image", panda diplomacy is an integral aspect of China's soft power (Wang, 2008, p. 257). With China seeking a "peaceful development" and an "objective and friendly publicity environment", giant pandas "easily conquer the hearts of people in foreign countries…and win favor for China" (Wang, 2008, p. 263; Hartig, 2013, p. 50). Panda diplomacy has been around since the seventh century and has progressed through three phases each defined by a different approach to carrying out the transaction, corresponding to the international climate and China's own bilateral relations. The presence, absence, addition, or subtraction of a panda at any time may be an indicator of China's interest, apathy, approval, or disapproval for a specific country or region at that time (Buckingham, David, & Jepson, 2013). This idea of panda diplomacy as an indicator of China's international stance is explored in multiple articles through case studies of individual panda transactions, and only one article – Buckingham, David, & Jepson, 2013 – mapped the very basics of the three phases through time and space. Given this focus of China's panda diplomacy as a possible indicator of its geopolitical interests, it is surprising that panda diplomacy has not been mapped more often.

4. Project Purpose

The purpose of this project is to illustrate how spatial and temporal analysis can characterize public diplomacy efforts like panda diplomacy. Understanding the geopolitical implications of soft power projections starts with its geospatial and temporal analysis and can ultimately support our strategic decision makers. The methodology and results presented here not only provide the study of public diplomacy a new geographic approach to explore its complex relationships, but they also provide the geospatial intelligence community a technique for exploring the geopolitical repercussions of public diplomacy through geovisual analytics.

5. Methodology

While the majority of articles in the literature are helpful for exploring these individual events with case studies or by highlighting snapshots in time with single-topic maps, the broader relationships that exist within panda diplomacy as a whole are more difficult to evaluate using traditional methodologies. Extrapolating from such small samples is likely to produce over-generalized conclusions for China's panda diplomacy approach. Being able to *dynamically* explore these broader relationships through time and space via interactive mapping combined with the association of supporting data enables more complex hypotheses to be explored and evaluated about China and its intentions with panda diplomacy as an instrument of soft power.

The primary research question explored in this project is: does the changing geospatial and temporal distribution of giant pandas around the world and the world's reactions predict China's developing or future intentions whether diplomatic, militaristic, economic, scientific or geographic? In the sections that follow, I describe a methodological approach for exploring that research question.

Geovisual Analytics

To answer my previous research question, I developed an approach that links both geographic and data mapping within a timeline. There are many tools and software packages that exist to analyze data visually and geospatially. For example, MacEachren et al. (2011) created a tool that used geolocations from Twitter messages to both map and graphically visualize the substance of Tweets across a region. While this tool would have been helpful to analyze opinions surrounding Giant Pandas in target nations, it is a specialized tool and would not support a complete analysis of data types other than Tweets. Another example of a general data analytics tool is Tableau. This tool enables interactive, visual analysis of data in order to "ask deeper questions and deliver more meaningful answers" in the context of business data analytics ("Business Intelligence and Analytics Software", n.d.). While it allows for content discovery, collaboration, interaction, and analysis of data, it considers geospatial representation as another tool of many rather than the central cornerstone as expected in geovisual analytics. Geovisual analytics can still be accomplished to some extent through Tableau, but it is more limited than other geovisual analytic focused tools as it has limited mapping capabilities and no built-in spatial analysis tools. Aside from existing tools and software packages, there is also always the option to create one's own system. However, as Amar and Stasko point out, adequate data representation in graphic design tools "often fails due to imperfect data collection and inexperienced presentation design" (Amar & Stasko, 2005, p. 434). In order to enable the best possible geovisual representation of panda diplomacy data, an existing toolkit was adapted to explore my research question.

The toolkit selected for this analysis was Esri's Insights for ArcGIS (Insights). This web-based geovisual analytics application was introduced in winter of 2017 and promises to "revolutionize decision-making with analysis that visually informs the organization of new, previously unexplored insights gained from the perspective of 'where'" ("Location Analytics Software", n.d.). This toolkit offers twenty different types of visualizations to be used to represent spatial data within the same interactive interface (Beale, 2017). The application also automatically tracks and diagrams the workflow so that it may be repurposed for other similar workflows, allowing exploration of other possible public diplomacy indicators in our case without reinventing the wheel. While academic literature has yet to focus on this toolkit in published research, there are multiple examples of this application's use contained within a gallery on the application's website ("Location Analytics Software", n.d.). In one such example global terrorist attacks are mapped within time and space. Insights centers the visualization on the timeline by encouraging the user to select a year or a range of years to represent within the dynamic tool (Voegtle, 2018). Another example analyzes fish escapes from Scotland's aquaculture industry. Not only does this tool include multiple maps and timelines, but it also integrates maps with chord diagrams to graphically represents their relationship in one location. Although separate analyses exist elsewhere on the page, analyzing this relationship using a single diagram is more digestible than it is to combine different data across different representations (Sandison, 2019).

Data Collection and Tool Development

In order to effectively map soft power, both the agent's means and the subject's reactions should be addressed (Grincheva, 2018). Gincheva (2018) divides the agent's means and subject's reactions into four aspects described as resources, conversion, target response, and outcome, and further defines geovisual methodological approaches unique to each aspect. Resources-based methods include mapping the foreign policy of target countries in relation to the agent country and mapping cultural resources and exports; conversion methods include mapping activities and audiences; target response methods include mapping networks and partnerships as well as locating influencers and engaged communities; outcome methods include mapping the subject's media visibility (coverage) and valence (tone) (Grincheva, 2018).

The scope of this project focused on a timeline of 1 January 2000 – 1 January 2020. The data required encompassed Chinese foreign policy, world events, giant panda events, relevant networks, and news articles. Data gathering focused solely on countries involved with giant pandas during the predefined timespan and was compiled from many sources listed in the Appendix. Since there was no pre-existing database containing all required information, a new database was created. While the data was initially collected and organized into separate databases according to the four aspects, it was ultimately reorganized into one single database for use within Insights. For the entire database, all locations contained within the database

were expressed as GCS WGS 1984 latitude and longitude coordinates and corresponded to the location of a zoo, panda conservation center, city, or a country's capital city.

For the first aspect of resources, data was gathered on Chinese foreign trade policy and world events. Internet searches were conducted using key phrases such as "Chinese trade agreements with [country]", "[country] and China's Belt and Road Initiative", and "[country] and China trade deals". World event searches used details and references to historical events found in published panda case studies and the other three aspect's sources. Specific key phrases like "Chinese uranium trade deals", "anniversary of Chinese rule", and "Sichuan Earthquake" were a result of these identified details and references. Topics focused only on countries involved with giant pandas and only on events within the predefined timeline. Policy focused solely on the evolution of China's trade agreements with each country (bilateral trade, trade negotiations, and free trade agreements), and world events data was focused on a combination of major natural disasters, political events, and trade deals (Belt and Road Initiative, uranium purchases, and other).

For the second and third aspects of conversion and target response, data was gathered on the movements of giant pandas between China and other countries, the births and deaths of giant pandas in countries outside of China, and the number of giant pandas involved with each event and each country as a whole over the predefined timeline. Giant pandas already existing outside of China at the start of the predefined timeline were included at the start of the timeline, 1 January 2000. A vast majority of these panda events and networks from 2000-2012 were gathered from Hartig's *Table 1. Pandas Living Outside of Mainland China (May 2012)* (2013, p. 74). Events and networks that occurred after May 2012 were identified through a comparison of multiple online panda databases maintained by each zoo and a few maintained by fans of giant pandas, as well as news articles returned from internet searches reporting on specific panda events. See the Appendix for a complete list of sources used.

For the last aspect of outcome, data was gathered on the visibility (coverage) and valence (tone) of news reports written by the host country on giant panda movements to and from China. Advanced search options available within Google's search engine were used to return news articles only written by a specific host country about a specific event. Results were narrowed by region to ensure returned articles originated only from the host country. Key phrases such as "giant pandas arrive from China" and "giant pandas return to China" coupled with the specific event's date, zoo, and names of pandas involved were used to focus the search results. Finally, the "News" filter was applied to ensure the results were from media sources. Visibility was rated based on the number of *relevant* search results returned: greater than five relevant articles returned received a "high" rating, five articles or less received a "low" rating, and searches that returned no results received an "unreported" rating. Valence was rated based on the tone derived from translating and reading the returned articles up to a sample size of ten articles. Returned results with an overall positive or negative tone were rated

respectively, results with a mixture of positively and negatively toned articles were rated as "neutral", and searches that returned no results were marked as "unreported".

Insights accepts four file types for uploading data: CSV, Excel, Shapefile, and GeoJSON. Since creating a geographic file was not necessary since my dataset did not contain complex geographic data beyond point data, I elected to work with Excel for its familiarity and simplicity. The data was compiled into an Excel spreadsheet, organized into a single table with various attributes, and then uploaded to an Insights workbook. The workbook was organized into six different pages: a title page, one for each of the four aspects and one for listing the data sources. The aspects were separated into different pages to enable more focused data exploration and to support project evaluation. The database was loaded into each page and location was enabled on all coordinates in the database. Two predefined filters were also added, one to filter the entire database by year and the other by country. The process of exploring different data representations produced different products specific to each aspect, listed in the next four subsections. The finished analysis product can be accessed for viewing HERE (https://insights.arcgis.com/#/view/9a7170c7866a40df9466ffa090022595).

Chinese Foreign Trade Policy and World Events

This page focused on exploring the aspect of resources. World events and trade policies representations were accompanied by a general overview of giant pandas outside of China in order to facilitate relationship discovery. Proportions of China's foreign trade policies were represented by a part-to-whole treemap divided by country and trade policy type. The spatial distribution of world events was symbolized on a world map and further described in an attribute table. Finally, the spatiotemporal distribution of giant pandas was measured using bar graphs and spatially represented using a graduated symbol map.

Figure 1: Resources aspect geovisually represented in Insights. From left to right, top to bottom: bar graph of maximum panda amount per country; proportional symbol map of pandas per location; treemap of trade policy type per country; attribute table describing world events; symbol map and legend of world event types distribution; bar graph of pandas existing outside of China per year divided by country. All windows are linked to filters by year and country.

Panda Events

This page focused on exploring the aspect of conversion. Panda movements, deaths, births, and total numbers were represented in a more focused analysis. A symbol map shows the spatial distribution of panda event types, an attribute table fully describes each event, and a bar graph and bubble chart measure the frequency and proportionality of the events. A line graph maps the number of pandas present in each country through time.

Figure 2: Conversion aspect geovisually represented in Insights. From left to right, top to bottom: bar graph of panda event types per region; bubble chart of total number of pandas affected by each event type; symbol map of event type distribution; attribute table describing panda events; line graph of total pandas per country over time. All windows are linked to filters by year and country.

Panda Diplomacy Network

This page focused on exploring the aspect of target response and resulting networks. Origins and destinations of panda events were further examined through the comparison of pandas entering or leaving communities outside of China. Giant panda movements between China and overseas were spatially represented using spider lines. Giant panda births and deaths outside of China were spatially represented using symbol maps. The proportional relationship between world region and type of panda event were represented using chord diagrams that linked the type and amount of each event to each region of the world.

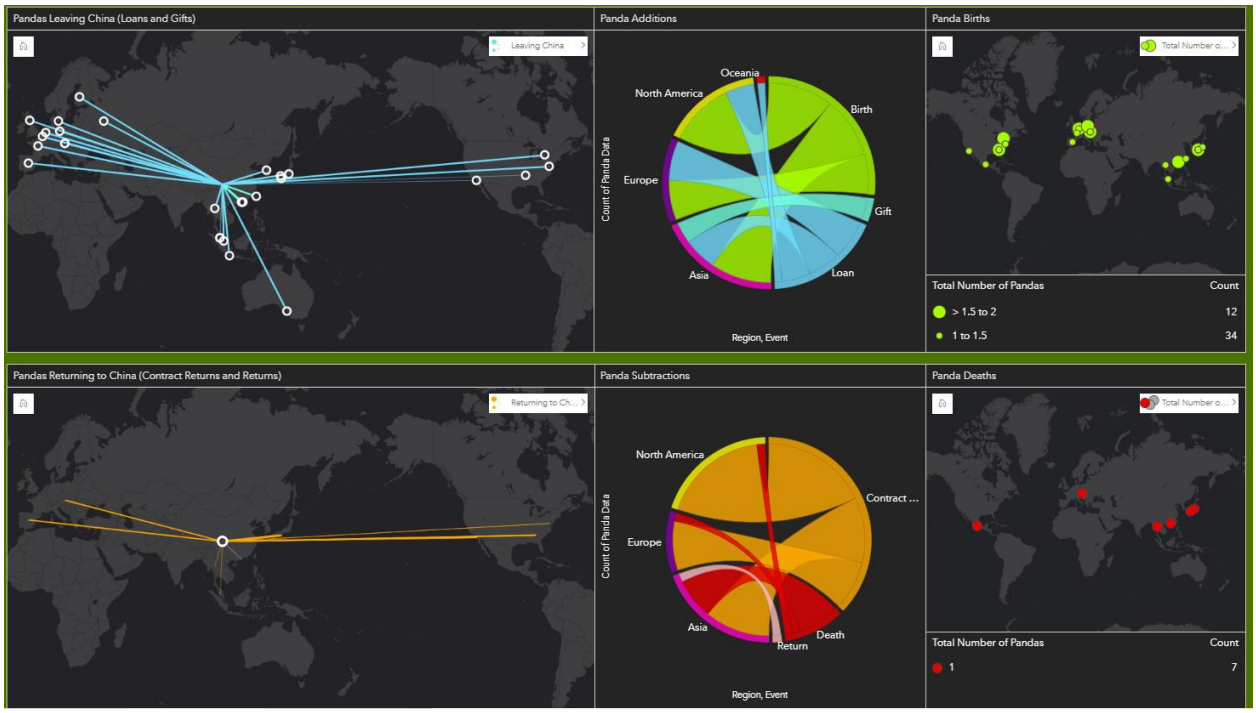

Figure 3: Target response aspect geovisually represented in Insights. From left to right, top to bottom: spider line map of giant pandas leaving China; chord diagram relating amount and types of additive panda events to region; proportional symbol map showing distribution of panda births outside of China; spider line map of giant pandas returning to China; chord diagram relating amount and types of subtractive panda event to region; symbol map showing distribution of panda deaths outside of China. All windows are linked to filters by year and country.

Visibility and Valence

This last page focused on exploring the aspect of outcome. Visibility and valence of host country reactions to giant pandas entering or leaving their country are represented on this page. Both visibility and valence are spatially represented using symbol maps and further described in an attribute table. Their relationship to each other and the frequency of each combination is measured using a heat chart. Finally, the proportional relationship between world region and both visibility and valence levels are represented using chord diagrams.

Figure 4: Outcome aspect geovisually represented in Insights. From left to right, top to bottom: heat chart comparing frequency of visibility and valence combinations; symbol map and legend showing distribution of visibility types; symbol map and legend showing distribution of valence types; attribute table describing visibility and valence; chord diagram relating amount and types of visibility to region; chord diagram relating amount and types of valence to region. All windows are linked to filters by year and country.

Evaluation

Evaluating the success of revealing unexplored public diplomacy patterns and relationships through Insights was not straight forward. Soft power is notoriously difficult to measure since it is comprised of intangible resources like culture, political values, and foreign policies, and public perception and opinion are fluid (Chitty, et al., 2017). Instead of measuring and evaluating these intangible resources directly, the tangible ability of the tool to accomplish appropriate analysis types was evaluated. Amar and Stasko explain two different goals of analytic tools: "'inform,' which deals with elaboration and summarization of data, and 'enable,' which deals with data exploration and derivation of relationships" (2005, p. 433). Within these two intents the authors defined two analysis gaps and six precepts that bridge the gaps. For example, if the ability of Insights to expose cause and effect was being evaluated within panda diplomacy relationships, evaluation would focus on how the tool highlights correlations, presents opposing ideas, and enables exploration of an individual relationship so the user is aware of where the relationship comes from (Amar & Stasko, 2005, p. 439). These six precepts enabled Insights to be evaluated according to its performance in geovisually analyzing the data of panda diplomacy.

Furthermore, there is a "lack of comprehensive methodological framework for measuring soft power effects" especially with regards to "the challenge of evaluating power" (Chitty, et al., 2017, p. 75). Evaluating soft power, however, essentially boils down to measuring two main aspects: the means used by the agent to inflict public diplomacy and the reaction of the receiving subject. Because the success of public diplomacy depends on both the capabilities of the agent and the perceptions of the subject, "the evaluation of soft power effectiveness should be two-directional" (Chitty, et al., 2017, p. 78). Thus, in order to measure these soft power effects to evaluate if patterns and relationships have been revealed, both the agent's means and the subject's reactions were analyzed using tailored geovisual methodological approaches. These approaches were based on Grincheva's (2018) four aspects of resources, conversion, target response, and outcome.

6. Results

Evaluating the effectiveness of Insights for ArcGIS geovisual analytics to reveal unexplored patterns in public diplomacy was conducted using heuristics developed by Amar and Stasko (2005), including six analytic knowledge precepts. Each precept was used to gauge the effectiveness of Insights for supporting geovisual analytics with the panda diplomacy dataset (Table 1).

Table 1: Heuristic evaluation of Esri's Insights for ArcGIS using six analytic knowledge precepts

Knowledge Precepts	Evaluation
Determining Domain Parameters	Parameters clearly communicated through labels, legends, tables, and pop-ups
Expose Multivariate Explanation	No explicit correlation options available; heat charts, chord diagrams, filtering, linking, and sorting available and heavily used
Facilitate Hypothesis Testing	Spatially: effective through distribution comparison and filtering; temporally: charts, graphs, and filtering available, but would benefit from further options such as a timeline slider
Expose Uncertainty	No capability
Concretize Relationships	Easy to isolate relationships for individual examination using filtering/linking/sorting; difficult to distinguish between exact matches and close but inexact matches
Expose Cause and Effect	No statistical capability; user explores possible causations or correlations

A second method of evaluation used focused on a general assessment of datatype representation ability. As proposed by Grivencha (2018), an analysis tool should be able to represent all data contained within the four aspects of measuring soft power in order to be able to analyze public diplomacy datasets sufficiently. Insights successfully represented all data within the four aspects of panda diplomacy: foreign trade policy and world events, panda events, panda diplomacy network, and visibility and valence. No aspect was left unexplored and each aspect had multiple methods in which it was able to be represented by Insights (Table 2).

Table 2: Evaluation of Esri's Insights for ArcGIS in representing four aspects of panda diplomacy

Aspect:	**Resources**	**Conversion**	**Target Response**	**Outcome**
Data Types	Foreign Trade Policy, World Events	Panda Events	Panda Networks	Visibility and Valence
Insights representation methods used	Symbol map, bar graph, treemap	Symbol map, bar graph, line graph, bubble chart	Spider line map, chord diagram, symbol map	Heat map, symbol map, chord diagram

7. Discussion

This evaluation shows that geovisual analytics is an effective method for representing public diplomacy and measuring soft power. Insights evaluated as a geovisual analytics tool was able to support five out of the six analytic knowledge precepts and represent all aspects of panda diplomacy multiple times using various methods available in the toolkit. The strengths of Insights were in its ability to present information, reveal relationships, and facilitate hypothesis testing. Any time information was presented, labels, pop-ups, and legends were automatically created to communicate what exactly was being represented. This upfront communication coupled with a plethora of sorting, linking, and filtering features ensured relationships between variables and attributes were almost automatically identifiable and explorable. The ease of knowing what information was being presented within what relationships meant hypothesis testing happened naturally and was supported by representation methods that facilitated further exploration. Ultimately, extending beyond simply visualizing information and actively encouraging curiosity is what makes Insights a strong geovisual analytics toolkit.

Areas of improvement for Insights include more developed options for deeper statistical analysis, correlation options, and temporal filtering. While the toolkit inspired data exploration and presented different perspectives, it did not provide concrete statistical evidence for proving or disproving conclusions about the data. Insights would benefit from not only more robust correlation options to concretize possible relationships but also an ability to expose uncertainty in statistical conclusions or dataset characteristics such as sample size. Additionally, the temporal filtering and representation options were not fluid to use and interrupted data exploration. The only way to filter an entire dataset by time was in a single- or multiple-selectable value predefined filter. This tool design is great for seeing one year or a few years in a snapshot, but poor for stepping fluidly through time. A timeline slider with play and pause functions would be a great tool to enable smoother dynamic temporal filtering.

In testing the case study hypothesis, previously unexplored patterns and relationships within the case study were able to be uncovered using geovisual analytics. By spatiotemporally mapping giant panda locations and trade events, a pattern emerged between giant panda loans and countries that agreed to support China's new international trade venture the Belt and Road Initiative (BRI). European countries that formally supported BRI each received a loan of giant pandas on average 3 years after the BRI cooperation agreement was signed. In addition, the number of countries hosting giant pandas increased from 12 countries in 2012, the year before China formally announced the BRI, to 23 countries by 2020. In fact, the current distribution of Giant Pandas across Asia, Oceania, and Europe mimics the proposed BRI routes (Figure 5). Of note is the United States' exclusion from the proposed routes. Since 2013 the United States has been experiencing a steady decline in their giant pandas with pandas returning to China under contract and contracts remaining unrenewed. The combination of these three patterns

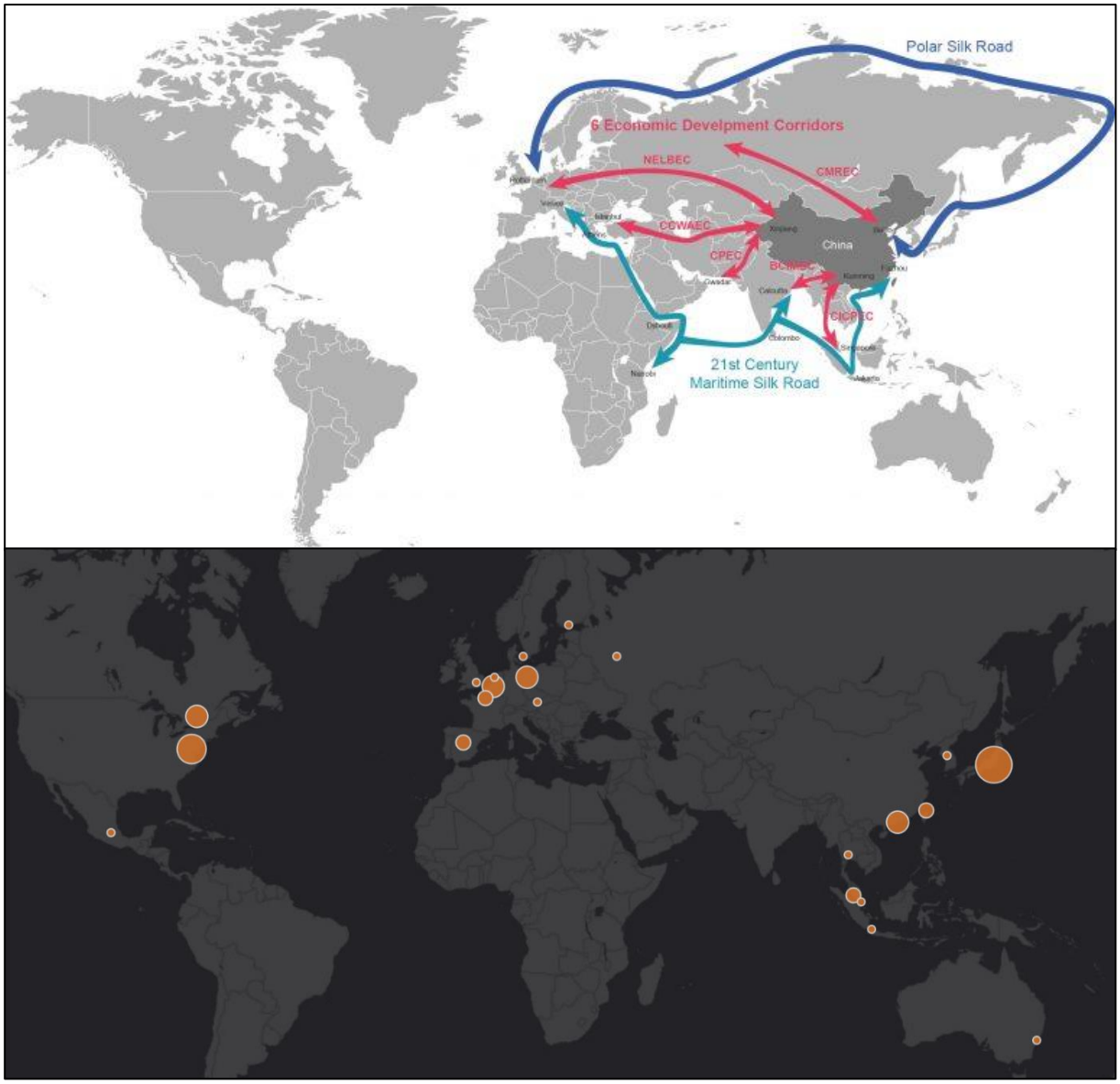

Figure 5: Comparison of China's proposed Belt and Road Initiative routes against giant panda distribution outside of China as of January 1, 2020 (mapped geovisually using Esri's Insights for ArcGIS). Route diagram retrieved from https://www.beltroad-initiative.com/belt-and-road/ on 19 April 2020.

highlights a possible developing relationship between giant panda loans and the BRI. Geovisual analytics was able to reveal this spatial relationship within this specialized public diplomacy dataset and prompt questions for future research on using giant panda loans as possible indicators for BRI endorsement and China's soft power targets.

While the primary research question for this project was able to be approached using Insights for ArcGIS, this project does have its limitations. First, the case study itself only provides exploration of public diplomacy and geovisual analytics as far as the data allows. While panda diplomacy did demonstrate multiple examples of this successful exploration, this project may not have provided an example for all types of relationships present in other public

diplomacy indicators. Secondly, the analytical approach and evaluation methods are by nature abstract and subjective. Because the topic of public diplomacy deals with intangible resources, the evaluation of abstract qualitative data and relationships produces a subjective interpretation of the analysis' success. While evaluation methods presented in the methodology pull from published sources, there was still subjectivity present in the results. Thirdly, as with any tool the output is only as good as the input. The database needed to study panda diplomacy through geovisual analysis was created for this project as there was no preexisting option. Thus, the database used is limited not only by the data and collection scope selected for use but also by possible human error in data entry and database design. Finally, this project is limited by the reliance of the Insights platform alone. Capabilities or relationships visible through Insights may not be discoverable using another geovisual analytics toolkit and vice versa. Effective and efficient data representation was also limited by the design of Insights as previously discussed and may have over- or under-represented relationships.

8. Conclusion

This project demonstrated that geovisual analytics tools can successfully uncover previously unexplored patterns and relationships present in public diplomacy datasets. It also provided results from a case study application of off-the-shelf geovisual analytics tools like Insights to explore geospatial and non-geospatial attributes of a geopolitical situation. The discipline of geography can clearly provide the studies of soft power, public diplomacy and panda diplomacy a new lens with which to explore complex physical and abstract relationships. Because the study and evaluation of soft power and public diplomacy are still new and developing, introducing a geographic frame of reference has the potential to ignite further scholastic study by unveiling previously unexplored insights.

Future research suggestions on public diplomacy using geovisual analytics would include continuing research into panda diplomacy and initiating investigations into other possible soft power indicators. As conservation science develops and as China's Belt and Road Initiative progresses, so will China's panda diplomacy. Conservation science techniques to release captive-bred pandas into the wild are still in their infancy, but if they develop with success in the future, a dramatically different global panda distribution may result (Buckingham, David, & Jepson, 2013). Analyzing that distribution may provide insights on the world's reception of China's conservation efforts or China's opinions of the world's conservation efforts. Likewise, with China's Belt and Road Initiative, the 133 countries along the planned land- and maritime-based paths of the proposed Eurasian trade route may see the development of a different giant panda distribution, indicating the status of China's international trade (Ren, 2019).

Furthermore, investigations into other soft power indicators such as South Korea's Hallyu culture or Turkey's acceptance of Syrian refugees may help to identify ulterior motives of

seemingly innocuous actions by state powers (Kim, Kim, & Connolloy, 2016; Cevik & Sevin, 2017). For example, mapping out the popularity and prevalence of South Korea's Hallyu culture might reveal what countries South Korea is actively targeting for alliance and support and what countries they consider adversaries or competitors (Kim, Kim & Connolloy, 2016). This information can provide valuable insight into South Korea's trending geopolitical goals. Additionally, in the case of Turkey accepting Syrian refugees, mapping media visibility and valence throughout the world alongside Turkey's own geographically targeted media campaigns may reveal insights into Turkey's soft power targets and the success or failure of its geopolitical intentions within a region crippled by war (Cevik & Sevin, 2017). In both examples, although mapping public diplomacy becomes more difficult as the soft power exchanges become increasingly more abstract, geovisual analytics could still provide a geographic frame of reference and spark different perspectives with which to explore the data.

Finally, geovisual analysis of other public diplomacy indicators is encouraged in order to develop new hypotheses and to explore their geopolitical relationships. This project has provided insight on methodology and evaluation methods for analyzing complex, abstract concepts inherent in public diplomacy. While public diplomacy is not a strictly geographic phenomenon, geovisual analytics as a tool facilitates data analysis from new perspectives to develop new hypotheses and explore geopolitical relationships. This process and the data curiosity it sparks may very well lead to creative discoveries and breakthroughs in public diplomacy research.

9. References

Amar, R. A., & Stasko, J. T. (2005). Knowledge precepts for design and evaluation of information visualizations. *IEEE Transactions on Visualization and Computer Graphics*, *11*(4), 432–442. https://doi.org/10.1109/TVCG.2005.63

Andrienko, G., Andrienko, N., Jankowski, P., Keim, D., Kraak, M.-J., MacEachren, A., & Wrobel, S. (2007). Geovisual analytics for spatial decision support: Setting the research agenda. *International Journal of Geographical Information Science*, *21*(8), 839–857. https://doi.org/10.1080/13658810701349011

Beale, L. (2017). *Insights for ArcGIS*. Esri. https://www.esri.com/content/dam/esrisites/en-us/media/pdf/data-visualization-options-in-insights-english-3.0.pdf

Buckingham, K. C., David, J. N. W., & Jepson, P. (2013). Diplomats and Refugees: Panda Diplomacy, Soft "Cuddly" Power, and the New Trajectory in Panda Conservation—ProQuest. *Environmental Practice*, *15*(3), 262–270. https://doi.org/10.10170S1466046613000185

Business Intelligence and Analytics Software. (n.d.). Tableau. Retrieved October 15, 2019, from https://www.tableau.com/

Cevik, S., & Sevin, E. (2017). A quest for soft power: Turkey and the Syrian refugee crisis. *Journal of Communication Management*, *21*(4), 399–410. https://doi.org/10.1108/JCOM-04-2017-0042

Chitty, N., Ji, L., Rawnsley, G. D., & Hayden, C. (Eds.). (2017). *The Routledge Handbook of Soft Power*. Routledge.

Gilboa, E. (2008). Searching for a Theory of Public Diplomacy. *The ANNALS of the American Academy of Political and Social Science*, *616*(1), 55–77. https://doi.org/10.1177/0002716207312142

Grincheva, N. (2018). Mapping museum 'Soft Power': Adding geo-visualization to the methodological framework. *Digital Scholarship in the Humanities*, 730–751. https://doi.org/10.1093/llc/fqy072

Hartig, F. (2013). Panda Diplomacy: The Cutest Part of China's Public Diplomacy. *Hague Journal of Diplomacy*, *8*(1), 49–78. https://doi.org/10.1163/1871191X-12341245

Hartig, F. (2014). New Public Diplomacy Meets Old Public Diplomacy—The Case of China and Its Confucius Institutes. *New Global Studies; Berlin*, *8*(3), 331–352. https://doi.org/10.1515/ngs-2014-0029

Kim, H. K., Kim, A. E., & Connolly, D. (2016). Catching up to Hallyu? The Japanese and Chinese Response to South Korean Soft Power. *Korea Observer*, *47*(3), 527–558.

Kraak, M.-J. (2003). Geovisualization illustrated. *ISPRS Journal of Photogrammetry and Remote Sensing*, *57*, 390–399. https://doi.org/10.1016/S0924-2716(02)00167-3

Location Analytics Software, ArcGIS Insights. (n.d.). Retrieved October 3, 2019, from https://www.esri.com/en-us/arcgis/products/arcgis-insights/overview

MacEachren, A. M., Jaiswal, A., Robinson, A. C., Pezanowski, S., Savelyev, A., Mitra, P., Zhang, X., & Blanford, J. (2011). SensePlace2: GeoTwitter analytics support for situational awareness. *2011 IEEE Conference on Visual Analytics Science and Technology (VAST)*, 181–190. https://doi.org/10.1109/VAST.2011.6102456

MacEachren, A. M., & Kraak, M.-J. (2001). Research Challenges in Geovisualization. *Cartography and Geographic Information Science*, *28*(1), 3–12. https://doi.org/10.1559/152304001782173970

Nye, J. S. (2008). Public Diplomacy and Soft Power. *The Annals of the American Academy of Political and Social Science*, *616*, 94–109. JSTOR. https://doi.org/10.1177/0002716207311699

Ren, H. (2019). Treaties on the International Trade Dispute Settlement and the China "Belt and Road" Initiative. *Beijing Law Review*, *10*, 441–454. https://doi.org/10.4236/blr.2019.103026

Robinson, A. C. (2011). Supporting synthesis in geovisualization. *International Journal of Geographical Information Science*, *25*(2), 211–227. https://doi.org/10.1080/13658810903430916

Robinson, A. C. (2017). Geovisual Analytics. *Geographic Information Science & Technology Body of Knowledge*, *Q3*. https://doi.org/10.22224/gistbok/2017.3.6

Sandison, E. (2019). *Marine Scotland fish escapes*. ArcGIS Insights. https://insights.arcgis.com/index.html#/view/407f1e6dec444d8295f4cea806cba6e7

Tobler, W. R. (1970). A Computer Movie Simulating Urban Growth in the Detroit Region. *Economic Geography*, *46*, 234–240. JSTOR. https://doi.org/10.2307/143141

Voegtle, P. (n.d.). *The global terrorism database*. ArcGis Insights. Retrieved October 14, 2019, from https://insights.arcgis.com/index.html#/view/d8c7bdd7fb7642f6b462973964b9bee0

Wang, Y. (2008). Public Diplomacy and the Rise of Chinese Soft Power. *The Annals of the American Academy of Political and Social Science*, *616*, 257–273. JSTOR.

10. Appendix

2 Chinese Pandas Arrive in Denmark. (2019, April 5). *US News & World Report*. https://www.usnews.com/news/world/articles/2019-04-05/2-chinese-pandas-arrive-in-denmark

A Brief History of Giant Pandas at the Zoo. (2019, February 23). Smithsonian's National Zoo. https://nationalzoo.si.edu/animals/brief-history-giant-pandas-zoo

Abend, L. (2019, April 12). 'Panda Diplomacy': A $24 Million Zoo Enclosure Angers Some. *The New York Times*. https://www.nytimes.com/2019/04/12/arts/design/copenhagen-zoo-pandas-china.html

An. (2017, April 13). Two giant pandas arrive in the Netherlands—Xinhua | English.news.cn. *Xinhua Net*. http://www.xinhuanet.com//english/2017-04/13/c_136203805.htm

Anti-Secession Law adopted by NPC. (2005, March 14). *China Daily*. https://www.chinadaily.com.cn/english/doc/2005-03/14/content_424643.htm

Berlin Zoo reveals names of panda twins. (2019, December 10). *Xinhua Net*. http://www.xinhuanet.com/english/2019-12/10/c_138618496.htm

Bernama. (2019, August 1). Second Malaysian-born panda named Yi Yi. *Free Malaysia Today*. https://www.freemalaysiatoday.com/category/nation/2019/08/01/second-malaysian-born-panda-named-yi-yi/

Channel News Asia. (2019, April 26). *"The Belt and Road Initiative is great": Malaysia PM Mahathir*. CNA. https://www.channelnewsasia.com/news/asia/mahathir-endorse-belt-and-road-china-11481782

Chatzky, A., & McBride, J. (n.d.). *China's Massive Belt and Road Initiative*. Council on Foreign Relations. Retrieved February 24, 2020, from https://www.cfr.org/backgrounder/chinas-massive-belt-and-road-initiative

Cheung, T. (2016, June 27). It's twins! Macau's giant panda Xin Xin delivers two cubs 45 minutes apart. *South China Morning Post*. https://www.scmp.com/news/hong-kong/education/article/1982072/its-twins-macaus-giant-panda-xin-xin-delivers-two-cubs-45

China Daily. (n.d.). *"Belt and Road" promotes China-EU food and logistics industry cooperation*. China Go Abroad. Retrieved February 25, 2020, from http://www.chinagoabroad.com/zh/article/the-one-belt-one-road-policy-promotes-china-netherlands-food-trade

China Daily. (2019, April 26). *Belt and Road to boost China-Austria closer ties in all areas*. https://www.chinadaily.com.cn/cndy/2019-04/26/content_37462647.htm

China Focus: China, Austria agree to establish friendly strategic partnership. (2018, April 9). *Xinhua Net*. http://www.xinhuanet.com/english/2018-04/09/c_137096222.htm

China's Belt and Road Network. (2019, April 12). *List of countries that have signed copperation documents with China to jointly build the "Belt and Road."* Belt and Road Portal. https://www.yidaiyilu.gov.cn/info/iList.jsp?tm_id=126&cat_id=10122&info_id=77298

Collard, R.-C. (2013). Panda politics. *The Canadian Geographer / Le Géographe Canadien*, *57*(2), 226–232. https://doi.org/10.1111/cag.12010

Embassy of the People's Republic of China in Ireland. (n.d.). Retrieved February 19, 2020, from http://ie.china-embassy.org/eng/

Emmott, R., & Guarascio, F. (2014, March 31). China's Xi wins EU pledge to consider free-trade deal. *Reuters*. https://www.reuters.com/article/us-china-eu-idUSBREA2U15J20140331

Female Giant Panda Born at Japan's Adventure World on Sept. 18, 2016, after Interval of 2 Years; 8th Child for Mother, 14th for Father. (2016, September 26). PR Newswire. https://www.prnewswire.com/news-releases/female-giant-panda-born-at-japans-adventure-world-on-sept-18-2016-after-interval-of-2-years-8th-child-for-mother-14th-for-father-300333786.html

Female giant panda cub born in Japan zoo. (2018, August 16). *The Straits Times*. https://www.straitstimes.com/asia/east-asia/female-giant-panda-cub-born-in-japan-zoo

Fikes, B. (2018, October 30). Panda patriarch Gao Gao leaves San Diego Zoo to return to China. *San Diego Union-Tribune*. https://www.sandiegouniontribune.com/news/zoo/sd-me-gao-gao-panda-20181030-story.html

Filippini, C. (2009). *Trade and investment in the relations between the european union and the People's Rpublic of China*. *27*, 225–240.

France, China to form nuclear power partnership. (2010, November 4). *Reuters*. https://www.reuters.com/article/china-france-nuclear-idUSLDE6A32MF20101104

Garske, M. (2014, January 10). 4-Year-Old Panda Leaves San Diego Zoo. *NBC 7 San Diego*. https://www.nbcsandiego.com/news/local/young-panda-yun-zi-leaves-san-diego-zoo/76388/

Giant pandas. (n.d.). Tiergarten Schönbrunn. Retrieved February 28, 2020, from https://www.zoovienna.at/en/zoo-and-visitors/giant-pandas/

Giant Pandas. (n.d.). River Safari at Singapore Zoo. Retrieved February 29, 2020, from https://www.wrs.com.sg/en/river-safari/animals-and-zones/giant-panda.html

Giant pandas arrive in Edinburgh. (2011, December 4). *BBC News*. https://www.bbc.com/news/uk-scotland-edinburgh-east-fife-16023328

Giant Pandas Arrive in Singapore. (2012, September 6). *Wall Street Journal*. https://www.wsj.com/articles/SB10000872396390443819404577634680765590706

Hartig, F. (2013). Panda Diplomacy: The Cutest Part of China's Public Diplomacy. *Hague Journal of Diplomacy*, *8*(1), 49–78.

Hiscock, G. (2006, April 3). *Australia, China sign uranium deal*. CNN. https://www.cnn.com/2006/WORLD/asiapcf/04/02/australia.china.uranium/index.html

Info & news about giant pandas. (n.d.). *Pandas, Pandas, Pandas ...* Retrieved February 27, 2020, from https://pandanews.wordpress.com/home/

International Trade Administration. (n.d.-a). *China Commercial Guide*. Retrieved February 19, 2020, from https://www.trade.gov/knowledge-product/exporting-china-market-overview?section-nav=3169

International Trade Administration. (n.d.-b). *Taiwan Commercial Guide*. Retrieved February 19, 2020, from https://www.trade.gov/knowledge-product/taiwan-market-overview?section-nav=5607

Introduction of Animals: Giant Pandas. (n.d.). Adventure World. Retrieved March 3, 2020, from http://www.aws-s.com/en/animals/panda/

Jacobs, J. (n.d.). *Panda Profiles*. GiantPandaGlobal. Retrieved February 27, 2020, from https://www.giantpandaglobal.com/panda-profiles/

Jacobs, J. (2015, November 29). Shu Xiang returns to Chengdu. *Giant Panda Global*. https://www.giantpandaglobal.com/zoo/chengdu-research-base-of-giant-panda-breeding/shu-xiang-returns-to-chengdu/

Kyodo News. (2008, May 1). Giant panda Ling Ling dies at Ueno Zoo. *The Japan Times Online*. https://www.japantimes.co.jp/news/2008/05/01/national/giant-panda-ling-ling-dies-at-ueno-zoo/
Lin Bing – An Adoptor's Story. (2013, December 14). *Pandas International*. https://www.pandasinternational.org/lin-bing-an-adoptors-story/
Lin Ping and her mate will come back. (2013, May 10). *Bangkok Post*. https://www.bangkokpost.com/thailand/politics/349373/popular-lin-ping-will-go-to-china-and-then-come-back-with-her-new-mate
List of presidents of the People's Republic of China. (2020). In *Wikipedia*. https://en.wikipedia.org/w/index.php?title=List_of_presidents_of_the_People%27s_Republic_of_China&oldid=947253436
Lun Lun. (n.d.). Zoo Atlanta. Retrieved February 27, 2020, from https://zooatlanta.org/animal-personality/lun-lun/
Macau government names panda twins Kin Kin & Hong Hong. (2016, September 19). *Macau News*. https://macaunews.mo/macau-government-names-panda-twins-kin-kin-hong-hong/
Macau panda dies, leaving male panda mate on his own. (2014, June 23). *New York Post*. https://nypost.com/2014/06/23/macau-panda-dies-leaving-male-panda-mate-on-his-own/
Macau receives two giant pandas on Saturday. (2010, December 13). *Macau News*. https://macaunews.mo/macau-receives-two-giant-pandas-on-saturday/
Meet the Giant Pandas. (n.d.). Calgary Zoo. Retrieved February 28, 2020, from https://www.calgaryzoo.com/visit/animals/giant-pandas
Memphis Zoo Will Continue to House Giant Pandas. (2013, October 30). *Memphis Zoo*. https://www.memphiszoo.org/blog/posts/memphis-zoo-will-continue-to-house-giant-pandas
Ministry of Commerce, PRC. (n.d.). *China FTA Network*. Retrieved February 19, 2020, from http://fta.mofcom.gov.cn/english/index.shtml
Ministry of Foreign Affairs of Japan. (2018, May 1). *The Seventh Japan-China-ROK Trilateral Summit*. Ministry of Foreign Affairs of Japan. https://www.mofa.go.jp/press/release/press4e_002019.html
Ministry of Foreign Affairs of the People's Republic of China. (2009). *Joint Statement Between the Government of the People's Republic of China and the Government of the Kingdom of Spain on Further Deepening China-Spain Comprehensive Strategic Partnership*. https://www.fmprc.gov.cn/mfa_eng/wjdt_665385/2649_665393/t537558.shtml
Mok, D. (2016, October 16). World's oldest giant panda Jia Jia put to sleep at Hong Kong's Ocean Park. *South China Morning Post*. https://www.scmp.com/news/hong-kong/health-environment/article/2028549/worlds-oldest-giant-panda-jia-jia-put-sleep-hong
Molnar, P. (2019, March 25). Last pandas at San Diego Zoo are leaving. *San Diego Union-Tribune*. https://www.sandiegouniontribune.com/business/tourism/sd-sdi-fi-zoo-pandas-20190325-story.html
Negotiations China-Thailand. (2012, May). Bilaterals. https://www.bilaterals.org/?-China-Thailand-
OBOReurope. (2018, April 15). From Austria to the Netherlands, Europe is willing to join the BRI. *OBOReurope*. https://www.oboreurope.com/en/austria-netherlands-bri/
O'Connor, J., & Nguyen, S. (2019, April 28). Thailand's PM commits to a global world vision as the country signs up to China's belt and road. *Thai Examiner*. https://www.thaiexaminer.com/thai-news-foreigners/2019/04/28/thailand-china-belt-road-economic-initiative-thai-chinese-high-speed-rail-lines-prime-minister/
Panda death in Thailand stirs suspicion in China. (2019, September 19). *The Straits Times*. https://www.straitstimes.com/asia/se-asia/panda-death-in-thailand-stirs-suspicion-in-china
Panda Portraits: A Look Back at San Diego's Beloved Bears. (2019, April 6). *NBC 7 San Diego*. https://www.nbcsandiego.com/news/local/san-diego-zoo-pandas-giant-bai-yun-xiao-liwu-shi-shi-hua-mei-gao-gao-china/81548/
Pandas travel to Russia for first time in 62 years. (2019, June 6). *China Global Times Network*. http://www.globaltimes.cn/content/1153314.shtml
Pei-chi, L., & Hsu, E. (2018, July 6). Giant panda Yuan Zai celebrates 5th birthday at Taipei Zoo. *Taiwan News*. https://www.taiwannews.com.tw/en/news/3475888
Pomfret, J. (2007, April 26). Hong Kong pandas arrive to breeding hopes. *Reuters*. https://www.reuters.com/article/us-china-hongkong-pandas-idUSHKG15770620070426
Rafferty, J., & Pletcher, K. (n.d.). Sichuan earthquake of 2008. In *Encyclopedia Britannica*. Retrieved February 24, 2020, from https://www.britannica.com/event/Sichuan-earthquake-of-2008
Rueda, M. (2013, April 29). Famous Giant Panda Dies in Mexico City Zoo. *ABC News*. https://abcnews.go.com/ABC_Univision/News/famous-panda-bear-dies-mexico-city-zoo/story?id=19067453
Scottish salmon leaps into China. (2011, January 12). *BBC News*. https://www.bbc.com/news/uk-scotland-scotland-business-12169191
Shiao, V. (2018, April 8). Singapore, China sign MOU on third-party markets along Belt and Road. *The Business Times*. https://www.businesstimes.com.sg/government-economy/singapore-china-sign-mou-on-third-party-markets-along-belt-and-road
Soliano, A. (2014, May 21). Giant pandas arrive in Malaysia today. *MalayMail*. https://www.malaymail.com/news/malaysia/2014/05/21/giant-pandas-arrive-in-malaysia-today/672531
State Council of the People's Republic of China. (2014, May 31). *China, Malaysia celebrate 40th anniversary of diplomatic ties*. http://english.www.gov.cn/premier/news/2014/08/23/content_281474983010666.htm
State Council of the People's Republic of China. (2017, March 27). *New Zealand signs B&R cooperation deal with China, first among Western developed countries*. http://english.www.gov.cn/premier/news/2017/03/27/content_281475608656688.htm
Taiwan rejects offer of pandas. (2006, April 1). *China Daily*. http://www.chinadaily.com.cn/china/2006-04/01/content_557585.htm
Takahashi, R. (2019, June 10). Giant panda cub Xiang Xiang at Tokyo's Ueno zoo to turn 2 this week. *The Japan Times Online*. https://www.japantimes.co.jp/news/2019/06/10/national/giant-panda-cub-xiang-xiang-tokyos-ueno-zoo-turn-2-week/
The Office of His Holiness the Dalai Lama. (n.d.). *Dignitaries Met 2011—Present* (https://www.dalailama.com/) [Text/html]. The 14th Dalai Lama; The 14th Dalai Lama. Retrieved February 23, 2020, from https://www.dalailama.com/the-dalai-lama/events-and-awards/dignitaries-met
The Pandas. (n.d.). Panda News. Retrieved February 23, 2020, from https://pandanews.org/the-pandas.1.html
The San Diego Zoo's Panda Cam: Meet the Pandas. (2013). The San Diego Zoo. https://web.archive.org/web/20131203012154/http://www.sandiegozoo.org/pandacam/meet.html
Vienna Zoo's twin panda cubs named Fu Feng and Fu Ban at no-show ceremony. (2016, November 24). *The Japan Times Online*.

https://www.japantimes.co.jp/news/2016/11/24/world/vienna-zoos-twin-panda-cubs-named-fu-feng-fu-ban-no-show-ceremony/
Vienna's famed late panda gets stuffed for final journey. (2017, February 7). Phys.Org. https://phys.org/news/2017-02-vienna-famed-late-panda-stuffed.html
Weissmann, J. (2016, September 28). Waking the sleeping dragon. *Slate Magazine*. https://slate.com/business/2016/09/when-china-joined-the-wto-it-kick-started-the-chinese-economy-and-roused-a-giant.html
Wertz, D. (2019, November 19). *China-North Korea Relations*. NCNK. https://www.ncnk.org/resources/briefing-papers/all-briefing-papers/china-north-korea-relations
Wong, D., & Koty, A. C. (2020, February 26). *The US-China Trade War: A Timeline*. China Briefing News. https://www.china-briefing.com/news/the-us-china-trade-war-a-timeline/
World Nuclear News. (2010, November 24). *Cameco signs Chinese uranium supply deal*. World Nuclear News. https://www.world-nuclear-news.org/ENF-Cameco_signs_Chinese_uranium_supply_deal-2411104.html
Wu, J., Lai, K. K. R., & Yuhas, A. (2019, November 18). Six Months of Hong Kong Protests. How Did We Get Here? *The New York Times*. https://www.nytimes.com/interactive/2019/world/asia/hong-kong-protests-arc.html
Xingbao the Panda Returning to Chengdu: Welcome Home and Adiós to Spain—Chengdu Research Base of Giant Panda Breeding. (n.d.). Retrieved April 19, 2020, from http://www.panda.org.cn/english/news/news/2017-10-18/6529.html
Xingbao the Panda Returning to Chengdu: Welcome Home and Adiós to Spain—Chengdu Research Base of Giant Panda Breeding. (2017, October 18). Chengdu Research Base of Giant Panda Breeding. http://www.panda.org.cn/english/news/news/2017-10-18/6529.html
Yan, S. (2013, October 14). *China swaps pandas for uranium deals*. CNNMoney. https://money.cnn.com/2013/10/14/news/economy/china-panda-trade/index.html
Yinglun, S. (2019, November 15). Two giant pandas born in Belgium given official names. *Xinhua Net*. http://www.xinhuanet.com/english/2019-11/15/c_138555838.htm
Yunling, Z., & Minghui, S. (2013). FTAs in the Asia-Pacific: A Chinese Perspective. *The Japan Institue of International Affairs*, *622*, 13.
Ziguo, L., & Jiapei, W. (2019, June 10). *Connecting the BRI with Eurasian Economic Union is strategic choice of China, Russia*. China Institute of International Studies. http://www.ciis.org.cn/english/2019-06/10/content_40780998.html