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Automatic Triggering of Contextual Suggestions for Web Pages

ABSTRACT

This disclosure describes techniques for automatic triggering of contextual suggestions based on web page content via a web browser. With user permission, the webpage content, including the uniform resource locator (URL) and page content are analyzed to determine whether to trigger contextual suggestions. For example, a simple web page may be analyzed using a client-side script. A user interface element with a suggestion is displayed if the analysis indicates that a suggestion is appropriate. For example, a suggestion to add ingredients to the user's shopping cart may be triggered when a user views a recipe web page. The suggestion may be overlaid on the web page in the browser user interface. Appropriate thresholds are used to trigger only such suggestions that are helpful.

KEYWORDS

- Suggestion element
- Suggestion chip
- Contextual suggestion
- Recipe webpage
- Smart browser
- Browser plugin
- Secure sandbox
- On-device script

BACKGROUND

Some web browsers include a feature whereby additional suggestions are automatically surfaced to a user based on the content of a web page that the user is currently viewing. For

example, if the web page includes certain types of content, e.g., recipes, the web browser (or plug-ins) can display suggestions related to the content in the form of user interface (UI) elements such as chips (small blobs of actionable text/ image) that appear over a portion of the web browser.

When a user selects the suggestion UI element (henceforth referred to as suggestion chip), e.g., by tapping or clicking, contextual actions can be performed. For example, if a web page that the user is viewing includes a recipe, the ingredients can be automatically added to a shopping cart application that the user has selected or the browser has selected (based on the usage and other contextual information, obtained with user permission). However, identifying the content type for a given web page can pose several challenges. For example, parsing web page source code is usually allowed only in web browsers with a secure sandbox (e.g., for JavaScript). Furthermore, some use cases may require parsing the web page contents and passing the parsed contents (e.g., a list of ingredients) to generate the suggestions. Extracting web page content can be a complex and computationally intensive task, even more so when the use case requires high recall and precision.

DESCRIPTION

This disclosure describes techniques for automatic triggering of contextual suggestions via a web browser based on web page content. With user permission and express consent, a combination of uniform resource locator (URL) based and/or web client script-based triggering is utilized to trigger contextual suggestions via a web browser. The user(s) or the suggestion service provider(s) can configure their web browser to disable contextual suggestions on certain pages, to selectively enable suggestions on specific websites, or to invoke the suggestions feature

manually. Web pages are parsed locally on the user device with specific user permission and in accordance with user preferences.



Fig. 1: Contextual suggestions can be displayed on a web page as a suggestion chip

Fig. 1 depicts an example web browser that includes a suggestion chip with contextual suggestions. As depicted in Fig.1, a web browser displays a web page (110) based on a URL (120) that a user has navigated to. With user permission and expressed consent and based on determination that the web page content includes a recipe, a suggestion chip (130) is displayed overlaid on the web page in the browser user interface (or in the operating system user interface). The suggestion chip includes options for the user to add recipe ingredients to their shopping cart.

Triggering of the suggestion chip is based on a determination of the context of web page content as well as a confidence measure of such determination. The determination can be made based on a URL of the web page and/or by using an on-device script at runtime. URL-based

context determination can be performed with relatively high confidence for popular websites. String matching logic and/or a previously crawled database of website content may be used for URL-based context determination. Script-based context determination can be made using an on-device script that performs web page content analysis and can provide the context for simple web pages with high level of confidence. A combination of URL-based and script-based triggering can be used for different types of web pages.

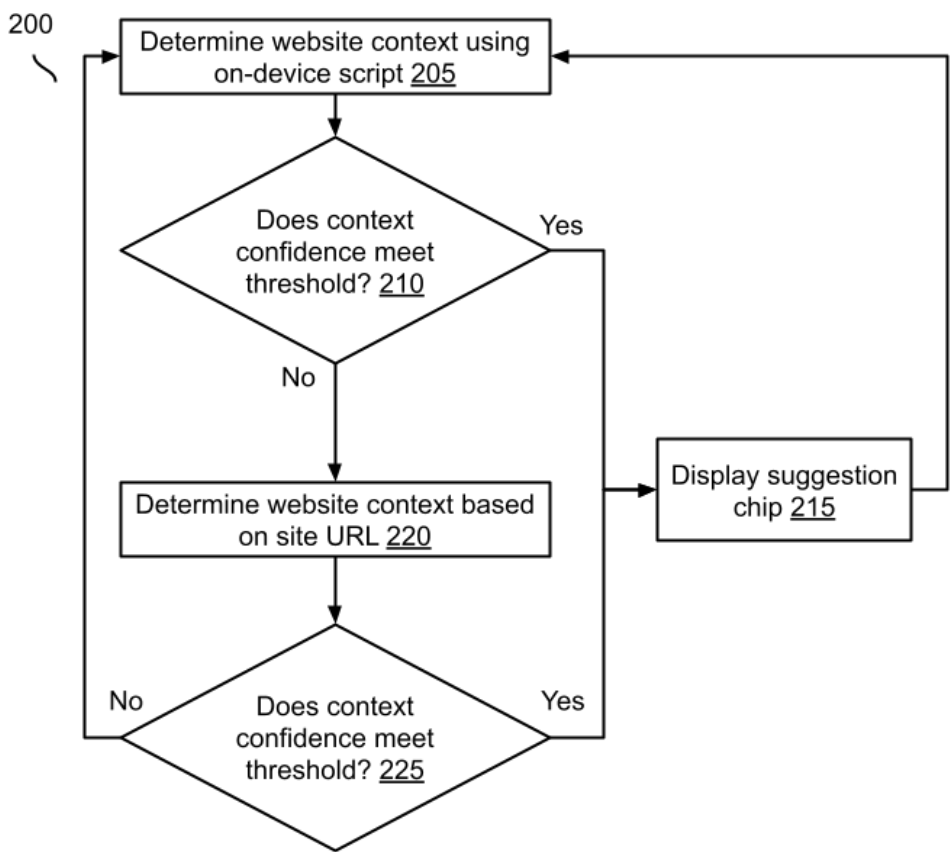


Fig. 2: Triggering contextual suggestions on a webpage

Fig. 2 depicts an example method for triggering of contextual suggestions, per techniques of this disclosure. The workflow is particularly suitable for websites with simple page content for which script-based triggering has high precision. The context of the web page is determined using an on-device script (205). It is determined whether a confidence level for the context

determination meets a threshold (210). If it is determined that the context confidence level meets the chip threshold trigger, a contextual suggestion chip is displayed (215) in the web browser.

If it is determined that the context confidence level does not meet the chip threshold trigger, a context is determined based on the URL of the website (220). Based on a determination (225) that the URL-based context determination has a context confidence level that meets a threshold, a contextual suggestion chip is displayed (215).

The order of execution of the script-based triggering and URL-based triggering can be changed. For example, for websites for which URL-based triggering has high precision, e.g., popular and/or complex web pages (e.g., that use iFrames), evaluation for URL-based triggering may be performed before that for script-based triggering. Further, in some cases, the method can be implemented that the threshold for both script-based and URL-based triggering must be met for a suggestion chip to be shown.

In some implementations, the confidence levels can be utilized to adjust various associated parameters. For example, the size of the suggestion chip and/or duration for which the suggestion chip is shown, or the options shown within the suggestion chip can be adjusted based on the confidence level.

Further to the descriptions above, a user may be provided with controls allowing the user to make an election as to both if and when systems, programs, or features described herein may enable the collection of user information (e.g., information about a user's browser, web pages visited by the user, social network, social actions or activities, profession, a user's preferences, or a user's current location), and if the user is sent content or communications from a server. In addition, certain data may be treated in one or more ways before it is stored or used so that personally identifiable information is removed. For example, a user's identity may be treated so

that no personally identifiable information can be determined for the user, or a user's geographic location may be generalized where location information is obtained (such as to a city, ZIP code, or state level) so that a particular location of a user cannot be determined. Thus, the user may have control over what information is collected about the user, how that information is used, and what information is provided to the user.

CONCLUSION

This disclosure describes techniques for automatic triggering of contextual suggestions based on web page content via a web browser. With user permission, the webpage content, including the uniform resource locator (URL) and page content is analyzed to determine whether to trigger contextual suggestions. For example, a simple web page may be analyzed using a client-side script. A user interface element with a suggestion is displayed if the analysis indicates that a suggestion is appropriate. For example, a suggestion to add ingredients to the user's shopping cart may be triggered when a user views a recipe. The suggestion may be overlaid on the web page in the browser user interface. Appropriate thresholds are used to trigger only such suggestions that are helpful.