Investigación en Ciencias de la Computación CI-0134

Avance 2 - Identificación de elementos web faltantes usando técnicas de procesamiento de lenguaje natural

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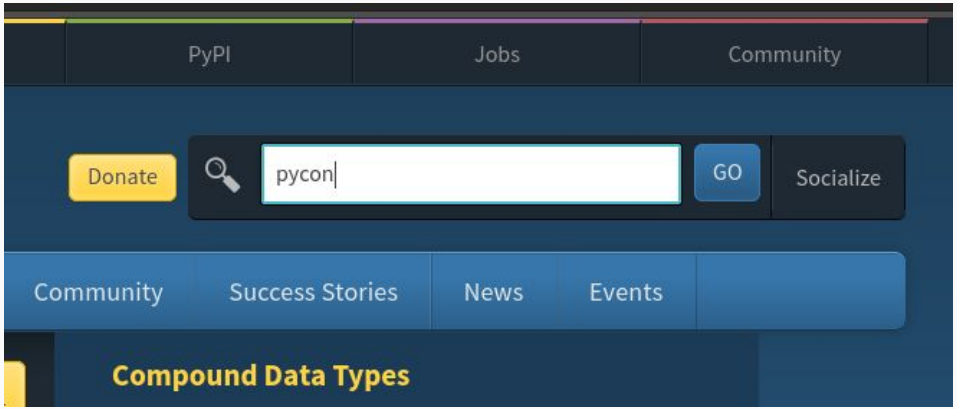
El Problema

Problema

```python
from selenium import webdriver
from selenium.webdriver.common.keys import Keys
from selenium.webdriver.common.by import By

driver = webdriver.Firefox()
driver.get("http://www.python.org")
# Get the HTML element with the name 'q'
elem = driver.find_element(By.NAME, "q")  # This is what usually fails
elem.clear()
# Type 'pycon' in the search box and hit Enter
elem.send_keys("pycon")
elem.send_keys(Keys.RETURN)
# Check that it found results
assert "No results found." not in driver.page_source
driver.close()
```




```
whitespace
<label class="screen-reader-text" for="id-search-field">Search This Site</label>
<input id="id-search-field" class="search-field" name="q" type="search" role="textbox" placeholder="Search" v
whitespace
<button id="submit" class="search-button" type="submit" name="submit" title="Submit this Search" tabindex="3"
<!--[if IE]><input type="text" style="display: none;" disabled="disabled" size="1" tabindex="4"><![endif]-->
```

Problema

```
driver = webdriver.Firefox()
driver.get("http://www.python.org")
# Get the HTML element with the name 'q'
elem = driver.find_element(By.NAME, "search")
elem.clear()
# Type 'pycon' in the search box and hit Enter
elem.send_keys("pycon")
```

```
(Selenium) fignewton@pop-os:~/Documents/Selenium/src$ /home/fignewton/Documents/Selenium/bin/python /home/fignewton/Documents/Selenium/src/test.py
Traceback (most recent call last):
  File "/home/fignewton/Documents/Selenium/src/test.py", line 8, in <module>
    elem = driver.find_element(By.NAME, "search")  # This is what usually fails
  File "/home/fignewton/Documents/Selenium/lib/python3.10/site-packages/selenium/webdriver/remote/webdriver.py", line 831, in find_element
    return self.execute(Command.FIND_ELEMENT, {"using": by, "value": value})["value"]
  File "/home/fignewton/Documents/Selenium/lib/python3.10/site-packages/selenium/webdriver/remote/webdriver.py", line 440, in execute
    self.error_handler.check_response(response)
  File "/home/fignewton/Documents/Selenium/lib/python3.10/site-packages/selenium/webdriver/remote/errorhandler.py", line 245, in check_response
    raise exception_class(message, screen, stacktrace)
selenium.common.exceptions.NoSuchElementException: Message: Unable to locate element: [name="search"]
Stacktrace:
RemoteError@chrome://remote/content/shared/RemoteError.sys.mjs:8:8
WebDriverError@chrome://remote/content/shared/webdriver/Errors.sys.mjs:180:5
NoSuchElementError@chrome://remote/content/shared/webdriver/Errors.sys.mjs:392:5
element.find/</<@chrome://remote/content/marionette/element.sys.mjs:134:16
```

¿Qué se propone?

- Utilizar técnicas de NLP
- Analizar el contexto en el DOM
- Analizar etiquetas y atributos
- Identificar los cambios en localizadores

Metodología

Tecnologías

Beautiful Soup

- Parsing del HTML

Long Short-Term Memory (LSTM) Network - TensorFlow

- Predicción de secuencias
- Predice la próxima palabra o elemento
- Mejor desempeño ante palabras fuera del vocabulario

Tokenización

```
<!DOCTYPE html>
<html lang="es" dir="ltr" prefix="content: http://purl.org/rss/1.0/modules/content/ dc: http://
2000/01/rdf-schema# sioc: http://rdfs.org/sioc/ns# sioct: http://rdfs.org/sioc/types# skos: htt
<head>
  <link rel="profile" href="http://www.w3.org/1999/xhtml/vocab" />
  <meta charset="utf-8">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <link rel="apple-touch-icon" href="/sites/all/themes/ecci_bootstrap/img/apple-touch-icon.png"
  <link href="https://fonts.googleapis.com/css?family=Open+Sans:300,400,600,700,800%7CShadows+I
  <meta http-equiv="Content-Type" content="text/html; charset=utf-8" />
<meta name="Generator" content="Drupal 7 (http://drupal.org)" />
<link rel="canonical" href="/inicio" />
<link rel="shortlink" href="/node/147" />
<link rel="shortcut icon" href="https://www.ecci.ucr.ac.cr/sites/default/files/icon.ico" type="
  <title>Escuela de Ciencias de la Computación e Informática | Escuela de Ciencias de la Comput
  <link type="text/css" rel="stylesheet" href="https://www.ecci.ucr.ac.cr/sites/default/files/c
<link type="text/css" rel="stylesheet" href="https://www.ecci.ucr.ac.cr/sites/default/files/css
<link type="text/css" rel="stylesheet" href="https://www.ecci.ucr.ac.cr/sites/default/files/css
<link type="text/css" rel="stylesheet" href="https://www.ecci.ucr.ac.cr/sites/default/files/css
<style>background-color:white;
</style>
<link type="text/css" rel="stylesheet" href="/sites/all/themes/ecci_bootstrap/vendor/bootstrap/
<link type="text/css" rel="stylesheet" href="https://www.ecci.ucr.ac.cr/sites/default/files/css
  <script src="/sites/all/themes/ecci_bootstrap/vendor/modernizr/modernizr.min.js"></script>
</head>
<body class="html front not-logged-in no-sidebars page-node page-node- page-node-147 node-type-
  <div id="skip-link">
    <a href="#main-content" class="element-invisible element-focusable">Pasar al contenido prin
  </div>
    <div class="body front">
```

```
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divfielditems divevenfielditem divcontainer divcenterrow divcolmd12spaceblocks plead pend diven
sectiongrayblock divcontainer divcolsm12spaceblocks divcolmd9 divregionregionhighlighted sectio
```
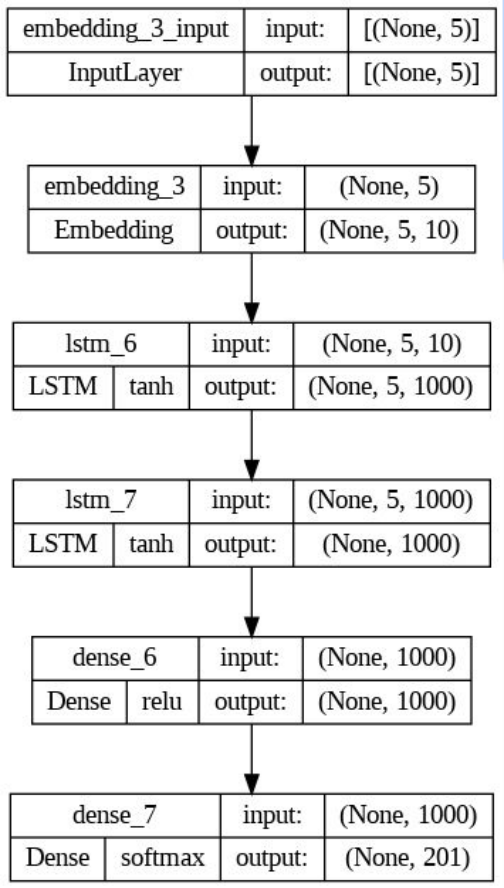
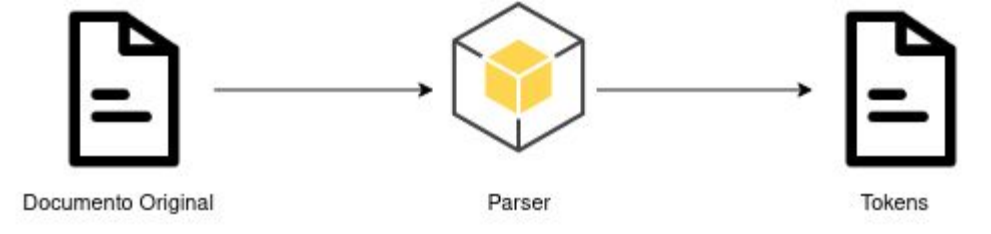

Entrenamiento

- Recorrer documento por “ventanas” o secuencias
- El tamaño de la ventana es un parámetro configurable

Modelo

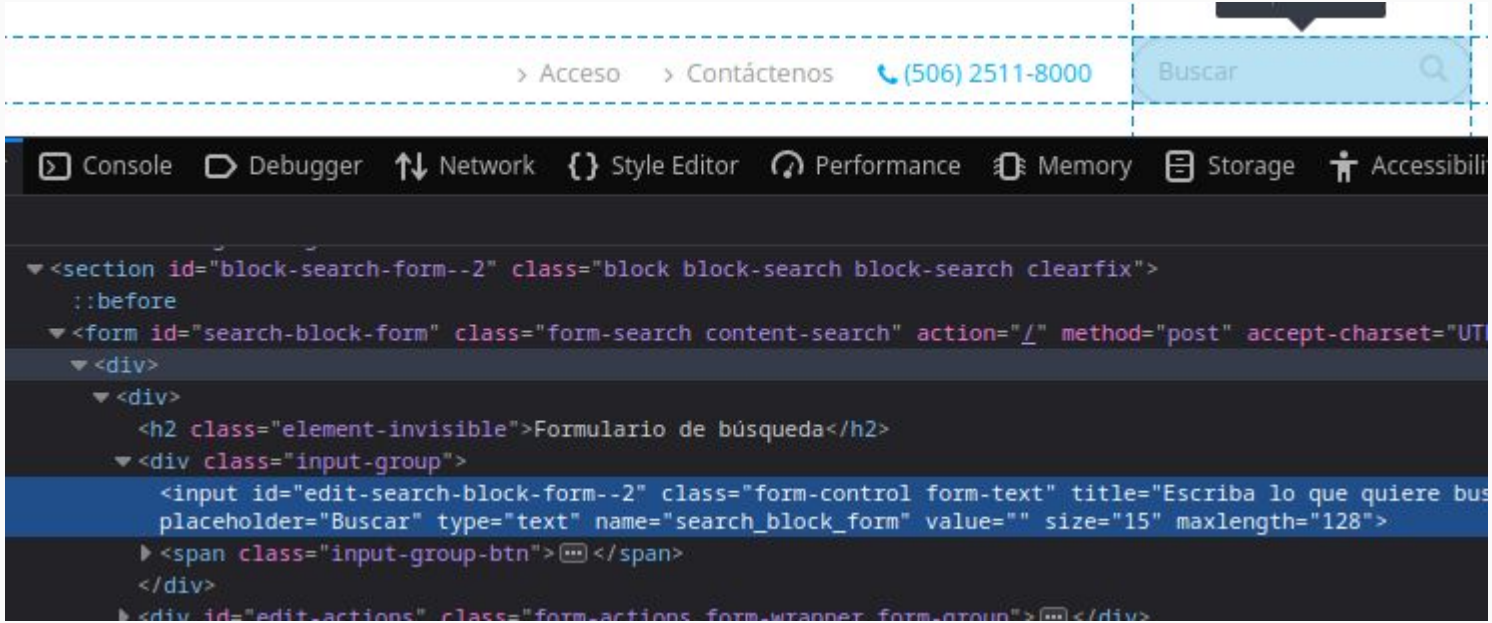

embedding_3_input | input: | [(None, 5)]
InputLayer | output: | [(None, 5)]
embedding_3 | input: | (None, 5)
Embedding | output: | (None, 5, 10)
lstm_6 | input: | (None, 5, 10)
LSTM | tanh | output: | (None, 5, 1000)
lstm_7 | input: | (None, 5, 1000)
LSTM | tanh | output: | (None, 1000)
dense_6 | input: | (None, 1000)
Dense | relu | output: | (None, 1000)
dense_7 | input: | (None, 1000)
Dense | softmax | output: | (None, 201)

Nuestro Producto (Paso 1)



Nuestro Producto (Paso 2)

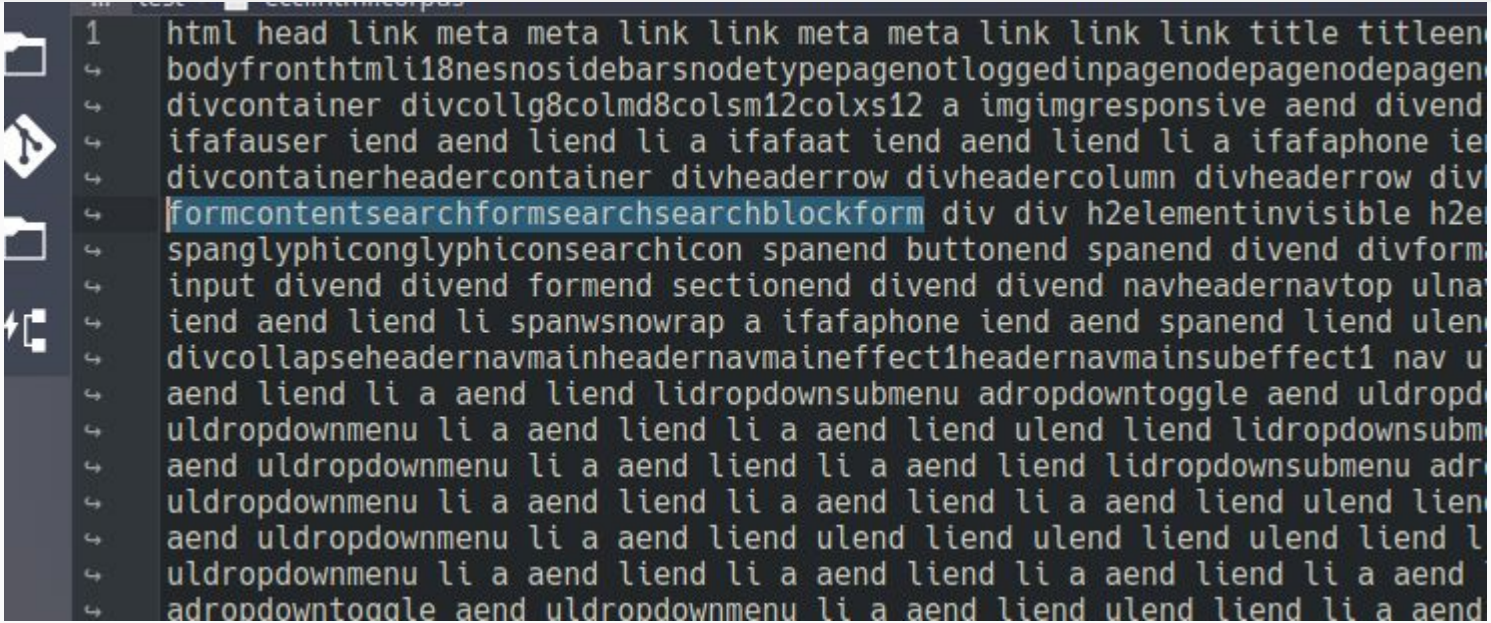
Ejemplo:


› Acceso
› Contáctenos
(506) 2511-8000
Buscar
Console
Debugger
Network
Style Editor
Performance
Memory
Storage
Accessibili
<section id="block-search-form--2" class="block block-search block-search clearfix">
::before
<form id="search-block-form" class="form-search content-search" action="/" method="post" accept-charset="UT

<h2 class="element-invisible">Formulario de búsqueda</h2>

<input id="edit-search-block-form--2" class="form-control form-text" title="Escriba lo que quiere bus
placeholder="Buscar" type="text" name="search_block_form" value="" size="15" maxlength="128">
…

Ejemplo: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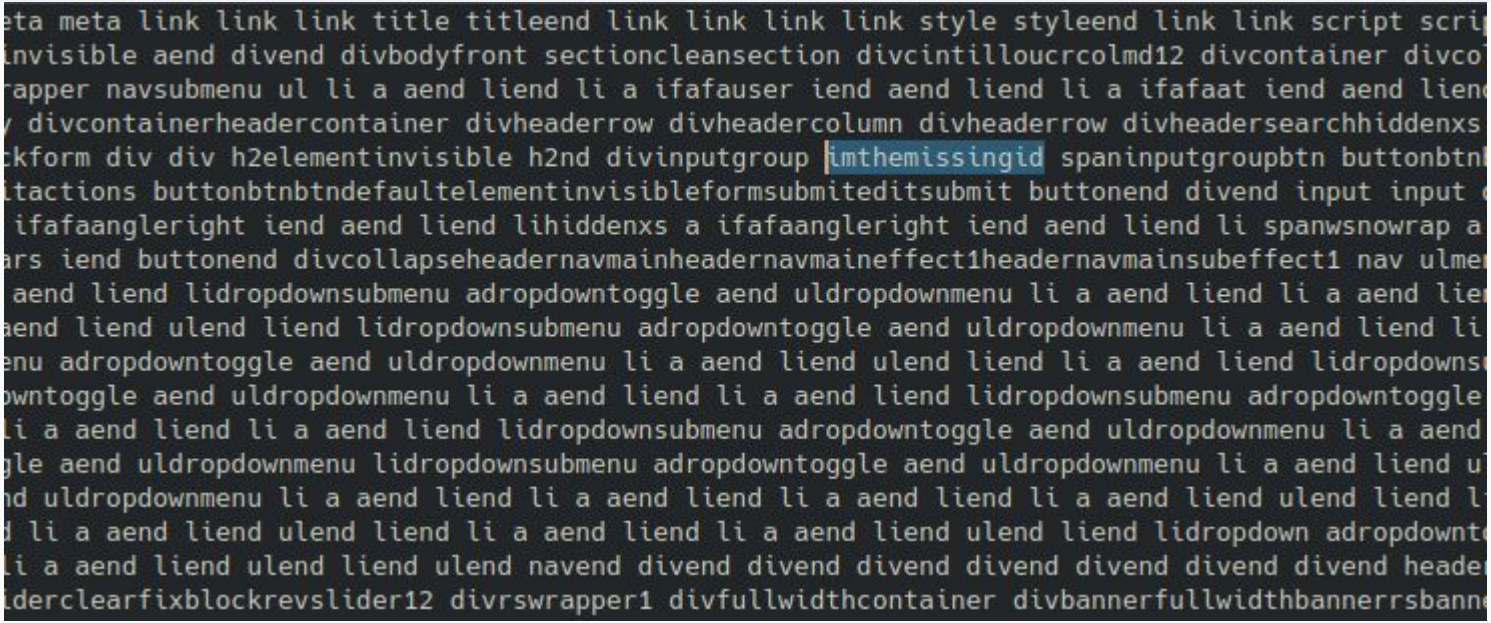
Ejemplo: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derclearfixblockrevslider12 divrswrapper1 divfullwidthcontainer divbannerfullwidthbannerrsbanne

Ejemplo:

Original Element ID: inputformcontrolformtexteditsearchblockform2

Expected New Element ID: imthemissingid

```
# Travel the new document
new_data = open('/content/drive/MyDrive/ecci.new.html.corpus', 'r', encoding='utf-8').read().split()
original_id = 'inputformcontrolformtexteditsearchblockform2'

new_id = None

for i in range(0, len(new_data) - window):
    words = ' '.join(new_data[i:i+window])
    if predict(words) == original_id:
        new_id = new_data[i+window]
        break
```

```
[ ] print('Could not find the new element' if new_id == None else 'The new ID is: ' + new_id)
```

```
The new ID is: imthemissingid
```

Gracias