User Interface Code Generation from Hand-drawn Sketch

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Presentation Outline

- Problem Statement and Objectives of Project
- Proposed Methodology
- Results and Discussion
- References

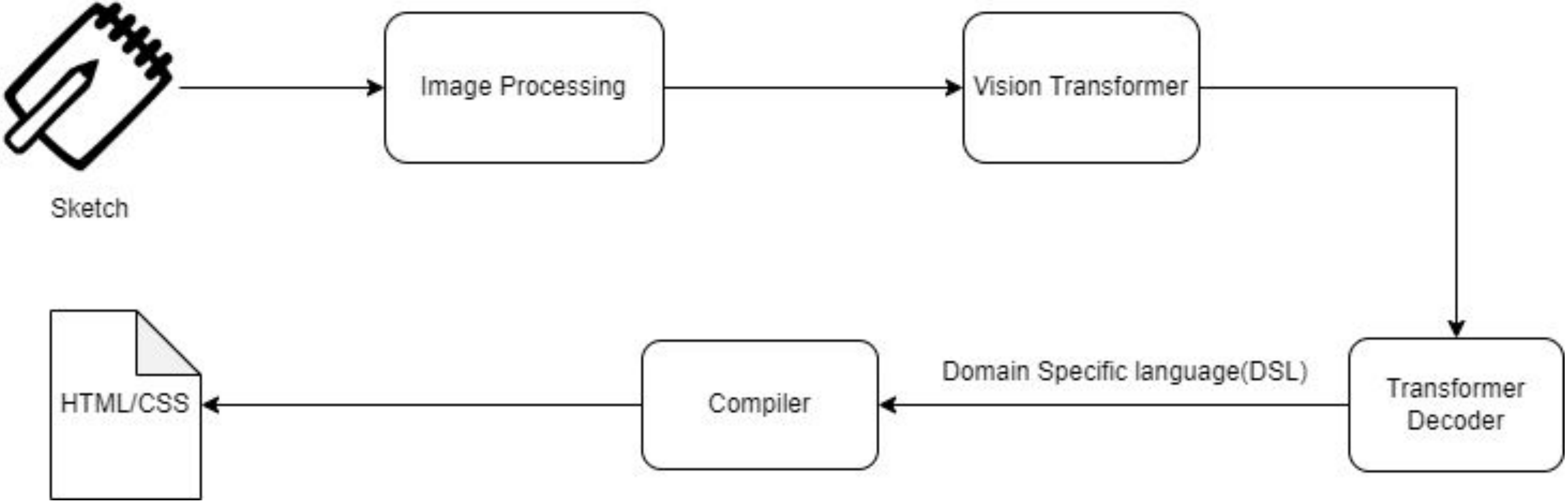
Problem Statement

- Conversion of sketches into function GUI code.

Objectives of Project

- To construct a model able to generate quick GUI prototype from sketch into HTML code.
- To create interactive user interface.

Methodology - [1] (System Block Diagram)



Methodology - [2] (Datasets)

- Dataset is a wireframe sketch and associated DSL code.
- We were not aware of any dataset which contained wireframes sketches and DSL code
- We will create our own dataset.

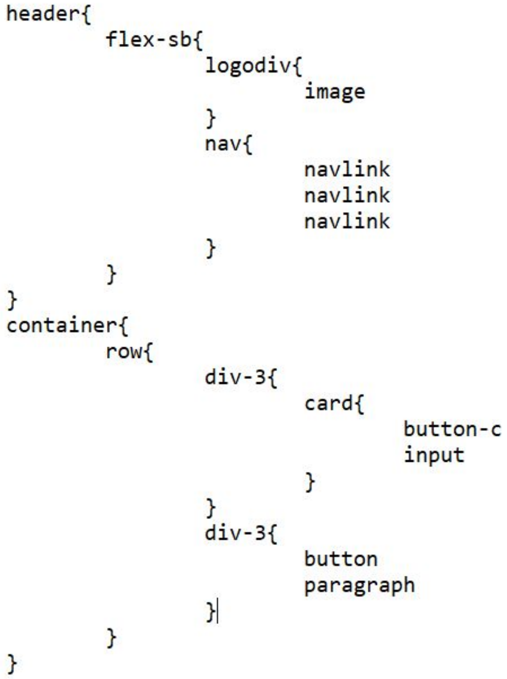
Methodology - [3] (DSL)

- Specialized language designed to address specific aspect or needs of a particular language.
- Designed the simple lightweight DSL to describe the GUI.
- Elements in DSL will be categorized into different hierarchical structures.

Methodology - [4] (DSL elements)

- Body
- Root
- Header
- Nav
- Navlink
- Logodiv
- Container
- Row
- Div-3
- Div-6
- Div-9
- Div-12
- Flex
- Flex-sb
- Flex-c
- Flex-r
- Text
- Text-c
- Text-r
- Paragraph
- Image
- Card
- Input
- Button
- Button-c
- Button-r
- Footer

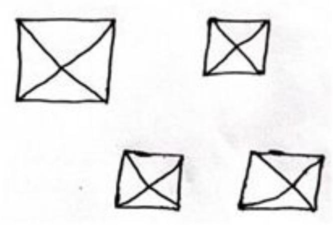
Methodology - [5]
(DSL code)



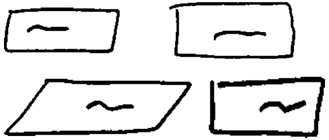
```
header{
        flex-sb{
                logodiv{
                        image
                }
                nav{
                        navlink
                        navlink
                        navlink
                }
        }
}
container{
        row{
                div-3{
                        card{
                                button-c
                                input
                        }
                }
                div-3{
                        button
                        paragraph
                }
        }
}
```

Figure: DSL code

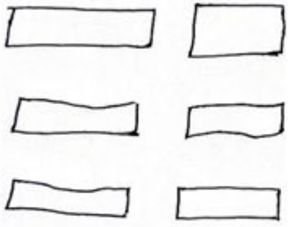
Methodology - [6]
(Sample elements)



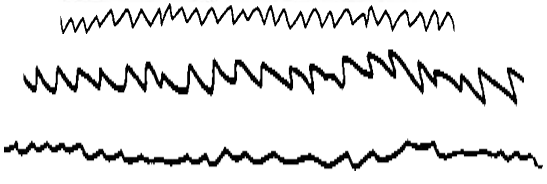
Image



Button



Input

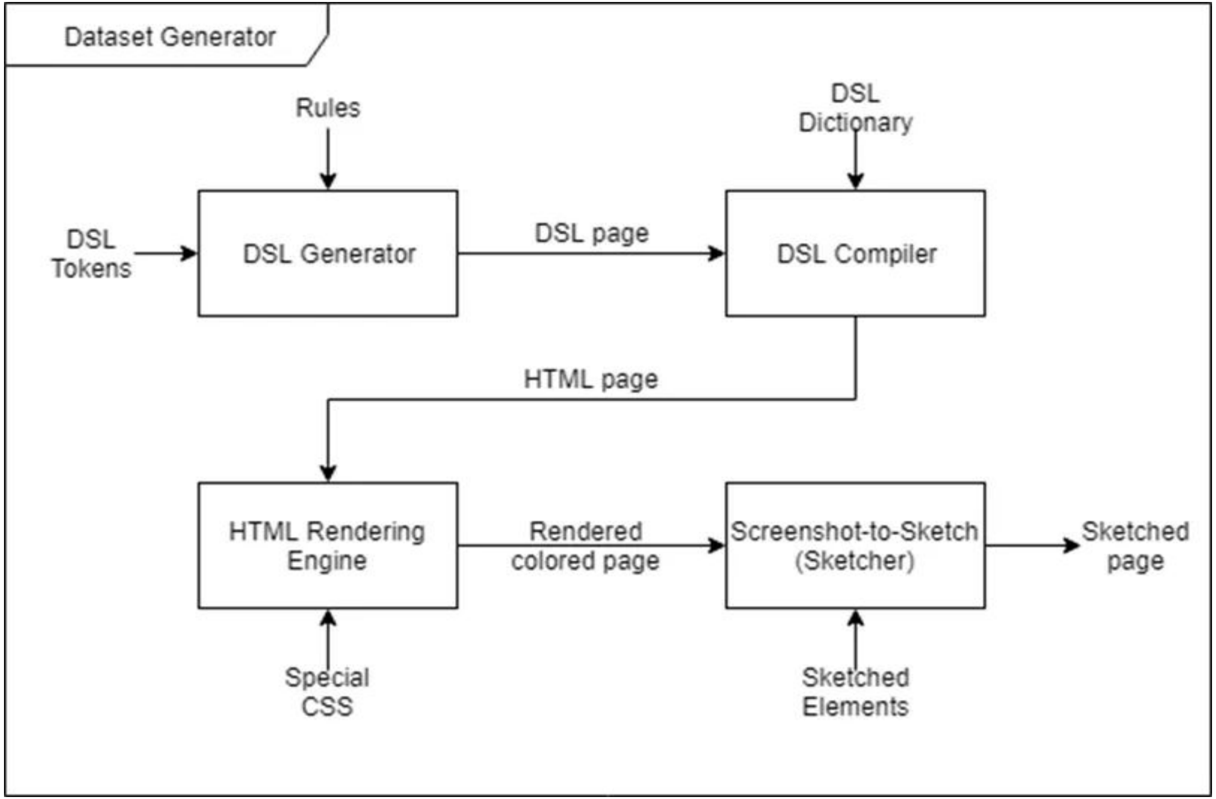


Paragraph

Methodology - [7]
(Dataset Generation Process)

- Dataset is the hand-drawn sketch and it's associated dsl.
- There is no existing dataset for it.
- Dataset generator is created to create as many dataset as required.

Methodology - [8] (Block Diagram)



Methodology - [9]
(Random DSL Generator)

- First step is to generate a DSL randomly.
- It denotes the elements in the user interface.
- DSL is generated by mixing the different possible combination of the element.

Methodology - [10] (Compiling the DSL code)

- Randomly generated DSL code is mapped into the corresponding HTML tag.

Methodology - [11]
(Rendering the Produced HTML)

- Mapped HTML file is rendered into the webpage with the special CSS file.
- CSS file helps to denote the different element with separate colour.

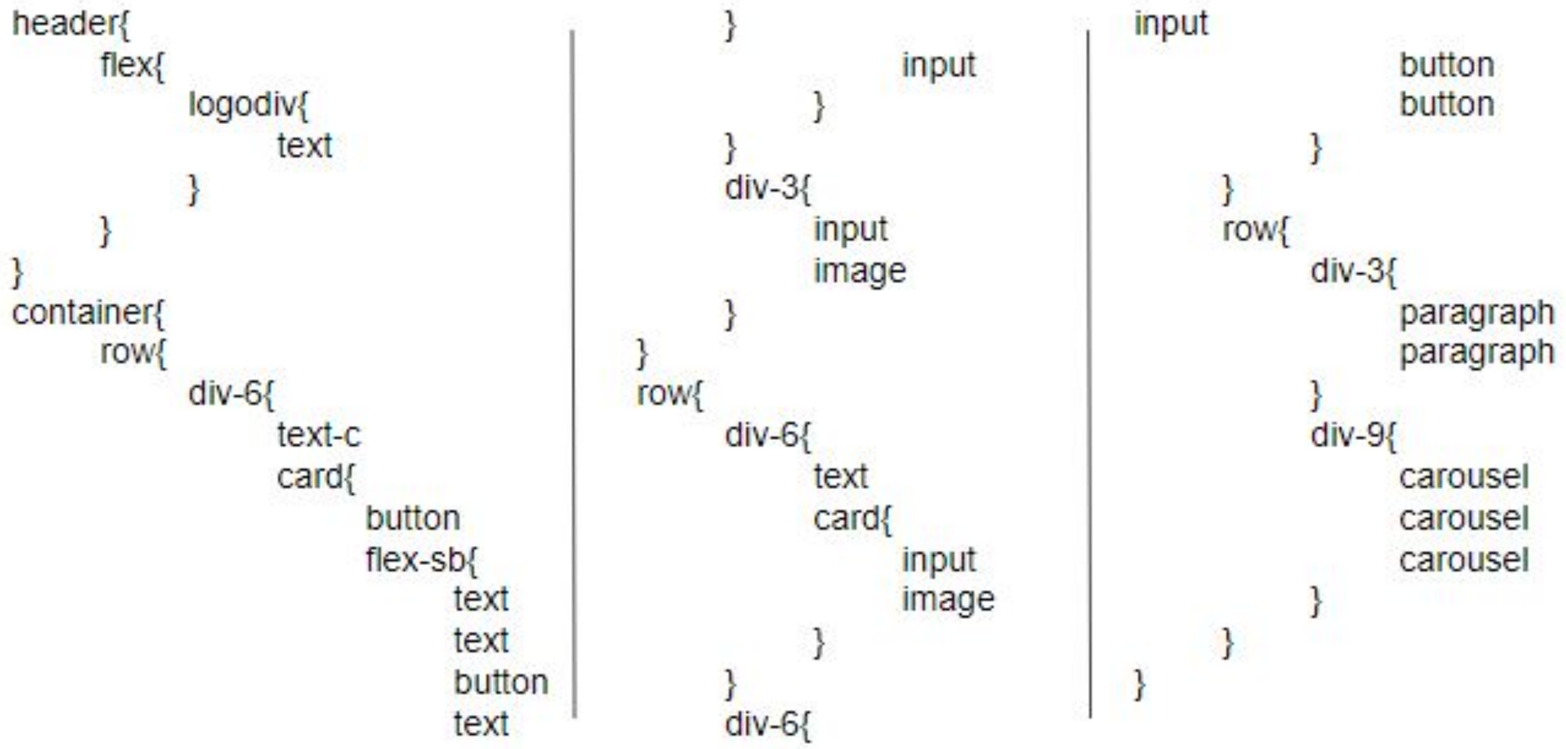
Methodology - [12]
(Finding outline of elements)

- Contour detection is applied to find the boundary of all the elements
- Then, the position is identified.

Methodology - [13]
(Placing hand-drawn sketch of element)

- Hand-drawn sketch of all the element is place at the position identified from above step.
- At last, sketch is obtained with its associated DSL code.

Results and Discussion-[1]



```
header{
    flex{
        logodiv{
            text
        }
    }
}
container{
    row{
        div-6{
            text-c
            card{
                button
                flex-sb{
                    text
                    text
                    button
                    text
```

```
    }
            input
        }
    }
    div-3{
        input
        image
    }
}
row{
    div-6{
        text
        card{
            input
            image
        }
    }
    div-6{
```

```
input
            button
            button
        }
    }
    row{
        div-3{
            paragraph
            paragraph
        }
        div-9{
            carousel
            carousel
            carousel
        }
    }
}
```

Generated DSL code

Results and Discussion-[2]

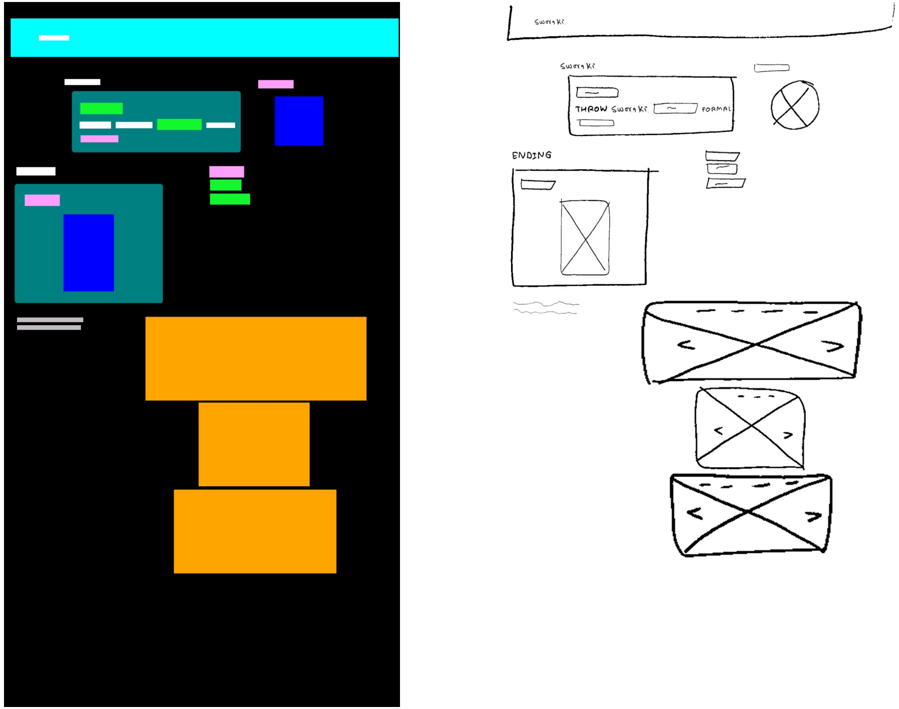


Fig. Generated HTML page and Sketch

References-[1]

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References-[2]

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