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UNIVERSITÄT
WUPPERTAL

Fakultät für Elektrotechnik,
Informationstechnik und Medientechnik

Lehrstuhl für Automatisierungstechnik/Informatik

Bachelor-Thesis

VSWorkbench: An Extensible Visual Studio Code Plugin for Bridging the Gap between Key Developer Tools

Sufyan Dahalan
1836674

Informatik

Wuppertal, den 31. August 2022

Betreuer Dr. Holger Arndt

Erstgutachter Dr. Holger Arndt
Zweitgutachter Dr. Marcel Schweitzer

BERGISCHE UNIVERSITÄT WUPPERTAL
RAINER-GRUENTER-STR 21
42119 WUPPERTAL
TELEFON (o2o2) 439 – 1

FACHBEREICH E
ELEKTROTECHNIK / INFORMATIONSTECHNIK / MEDIENTECHNIK
Univ.-Prof. Dr.-Ing. Dietmar Tutsch

Bachelor Thesis

KANDIDAT	Max Mustermann
MATRIKELNUMMER	123456
STUDIENGANG	Informationstechnologie
STUDIENRICHTUNG	IS
BETREUER	Vorname Name

THEMA

Entwurf und Entwicklung eines Lorem-Ipsum-Generators

AUFGABENSTELLUNG

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Integer libero erat, tincidunt quis molestie nec, ultrices nec felis. Cras tincidunt tempor sapien ac cursus. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Nunc eu magna ut sem condimentum posuere. Nulla ullamcorper sapien et sem placerat in blandit libero tempor. Pellentesque non justo in arcu porta lacinia non eget massa. Integer vel lectus sed ipsum sagittis mollis. Cras congue, orci et suscipit tristique, enim metus congue ante, et adipiscing neque justo eget mi. Aliquam ut ligula tortor, eu commodo ante. Nam faucibus lorem ultricies metus suscipit cursus. Maecenas adipiscing convallis felis, mattis sollicitudin sapien aliquam eget. Vivamus cursus mattis massa id scelerisque. Quisque dolor tellus, bibendum in adipiscing in, imperdiet vel augue. Fusce posuere lacus vel neque molestie in congue leo ultrices.

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ERSTGUTACHTER : Prof. Dr.-Ing.
ZWEITGUTACHTER : Prof. Dr.-Ing.

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Ausgabedatum :
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Eidesstattliche Erklärung

Hiermit versichere ich, dass ich die Arbeit selbstständig verfasst, keine anderen als die angegebenen Quellen und Hilfsmittel benutzt sowie Zitate kenntlich gemacht habe.

Wuppertal, den 31. August 2022 _____

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Einverständniserklärung

Ich bin damit einverstanden, dass meine Abschlussarbeit wissenschaftlich interessierten Personen oder Institutionen zur Verfügung gestellt werden kann. Korrektur- oder Bewertungshinweise in meiner Arbeit dürfen nicht zitiert werden.

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Kurzfassung

Der Text der Kurzfassung wird hier eingetragen. Dies hier ist ein Blindtext zum Testen von Textausgaben. Wer diesen Text liest, ist selbst schuld. Der Text gibt lediglich den Grauwert der Schrift an. Ist das wirklich so? Ist es gleichgültig, ob ich schreibe: „Dies ist ein Blindtext“ oder „Huardest gefburn“? Kjift – mitnichten! Ein Blindtext bietet mir wichtige Informationen. An ihm messe ich die Lesbarkeit einer Schrift, ihre Anmutung, wie harmonisch die Figuren zueinander stehen und prüfe, wie breit oder schmal sie läuft. Ein Blindtext sollte möglichst viele verschiedene Buchstaben enthalten und in der Originalsprache gesetzt sein. Er muss keinen Sinn ergeben, sollte aber lesbar sein. Fremdsprachige Texte wie „Lorem ipsum“ dienen nicht dem eigentlichen Zweck, da sie eine falsche Anmutung vermitteln.

Abstract

The english version. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like “Huardest gefburn”? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special content, but the length of words should match the language.

Inhaltsverzeichnis

1 Introduction | Motivation

2 Problem und Goal

Programming and software development has its deep roots in the scientific communities and largely resided, for the first couple of decades, in the (obscure|dark|somepoeticthing)? rooms of researchers. As programming found its way into commercialization not bound to any hardware product and was made generally available to the public through the internet/web, the demand for programmers and software developers soared in a way that made it hard to (keep the pipeline fed|keep up with demand). This great demand and meager supply of programmers made it a highly vital task to squeeze efficiency out of the very few programmers available. Hence developer tools.

Developer tools try to achieve a big subset of things, enabling developers to cooperate on a higher scale (communication software [teams, zoom, email], collaboration tools for technical and nontechnical staff [jira, trello, atlassian wiki], collaboration tools for technicals that touch on many different subjects [git, gitlab, github], tools made to save time [CICD, gitlab ci, github action], tools made to increase precision and correctness of work output
made by programmers [automated testing frameworks => cypress, playwright], and debugging).

These developer tools are essential in the work life of a programmer. Use them fluently and efficiently, and you will make your life easier. ## Developer Tooling ### History | Development of Developer Tools Over the Years, Current Status of Developer Tools ## Problem and Goal

2.1 Context Switching: Concept in theory and affects on day to day reality of developers

tasks needing high memory load and/or requiring the developer to be in a state of high flow can have sinked productivity when they are even slightly interrupted1 todo # Fundamentals

2.1.1 Tech Stack

HTML

HTML (HyperText Markup Language) is the standard language used to used to create hypertext documents that are platform independent, usually rendered on a browser. HTML documents can be used with generic semantics to represent information from a wide range of domain, including but not limited to: mail, hypermedia, news, documentation, or simple structured documents with inlined graphics. [BL95] HTML in its current form traces its origins to a Request For Comment [1] by Tim Berners-Lee and has ever since been developed by a set of companies (for WHATWG: Apple, Google, Mozilla, Microsoft) under the umbrella of the w3c and the WHATWG. HTML is a living standard, meaning changes occur without maintaining or incrementing a version number. Informally , however, the HTML living standard is called HTML5.

[1] An RFC is a document that contains technical specifications and organizational notes for the Internet. For more information see https://www.ietf.org/standards/rfcs/ . #### CSS

CSS is a style sheet mechanism that allows web page authors and readers to attach style [HWL96]. Using CSS, a developer can, among other things, specify fonts, colors and spacing. Latest CSS standard is CSS3, put forward by the W3C [HWL96]. It has also been standardized in (TODO year) and progress and future development on it is managed by a joint committee under the umbrella of the W3C.

Javascript

Javascript (often abbreviated JS) is an event driven language developed to be used in browsers. It features JIT, or just-in-time-compilation, which means that the javascript files received by the browser will be compiled and run simultaneously. The two most common variants of Javascript are CommonJS and EcmaScript. While EcmaScript is developed solely for the browser, packaging DOM TODO{explain more} manipulation libraries with it, CommonJS is developed for server-side use, therefore it is shipped with modules that enable Javascript to interact with its hardware, including but not limited to IO, template engines, object relational mappers, and middleware [Dan09]. The Javascript variant used in this project is EcmaScript.

Typescript

Typecript is a statically typed subset of js todo{cite wikipedia or smth}, developed and maintained by Micosoft. While there were multiple trials to create a statically typed language that transpiles to Javascript, Typescript is the langauge that saw the most adoption by the community, consistently scoring high on StackOverflow Developer Surveys [Inc21][Inc22]. Typescript currently has approximately 82.9k stars on GitHub, making it the 48th most starred repository on GitHub currently [Eva22].

2.2 The modern web architecture (web 2.0)

2.2.1 Client-Server Architecture

The client-server architecture describes the relationship between the device of a website owner (server) and the devices of users (client). It has it's roots in the early ARPANET days in the 1970s where the Stanford researchers worked toward creating interactive programms that function across computer networks [Rul69]. The server receives HTTP requests across the network and returns data, usually in the form of HTML, CSS, JS for the rendering of a website or raw data, usually as JSON or raw text data. The client-server architecture is used as an abstraction to simplify the workflow of clients. The client does not need to knwo bla bla. Conversely, the server must take care of business logic required to retrieve data requested by the client, and return an internet package, containing the response, in a way that follows common API specifications such as ReST or GraphQL todo{cite smth? idk}. The client then takes care of building a user friendly interface to hold the information given back by the server.

2.2.2 HTTP methods, REST, GraphQL

HTTP [FIG+99] is an application-level protocol for distributed, collaborative information systems. It is a generic, stateless, protocol which can be used for many tasks beyond its use for hypertext through extension of its request methods, error codes and headers. It defines the specification through which common internet communication between systems happens. It sets standards for interactions between different systems, most notabely the HTTP GET and HTTP POST methods. The HTTP GET method is used to retrieve data from an API. In case authentication is required, it is achieved through a special `Authentication` header, enabled by the generic nature of HTTP. An HTTP POST method is used to transfer data back to the API, e.g. to perform a set of operations based on the data transferred or to simply save it.

REST defines a way to

todo{attach a screenshot of the api.ts file, showcasing REST api requests}

GraphQL is a project released by developed by Facebook and the opensource community that defines a way to query data from the server, enabling the developer to get exactly the data he needs, nothing more and nothing less [Byr15].

It abstracts some stuff and make shit easier blablabla

2.2.3 iframes

2.2.4 vscode and electron js

2.2.5 Authentication, Authorization and OAuth Tokens

3 Implementation

3.1 Authentication and Authorization

3.2 Gitlab REST and GRAPHQL apis

3.3 publishing on marketplace.visualstudio.com , current progress

3.4 goals moving forward

```
import { AUTH_TOKEN_KEY, GITLAB_INSTANCE_KEY } from "./globals/";

function initStorage(context: vscode.ExtensionContext) {
    context.globalState.setKeysForSync([AUTH_TOKEN_KEY]);
    context.globalState.setKeysForSync([GITLAB_INSTANCE_KEY]);
}
```

example for sm maths:
$x_i = 5$
$\sqrt{x^2 + 1}$
example for sm centered maths:

$$x_i = 5$$

$$\sqrt{x^2 + 1}$$

image example
caption used is the alt text

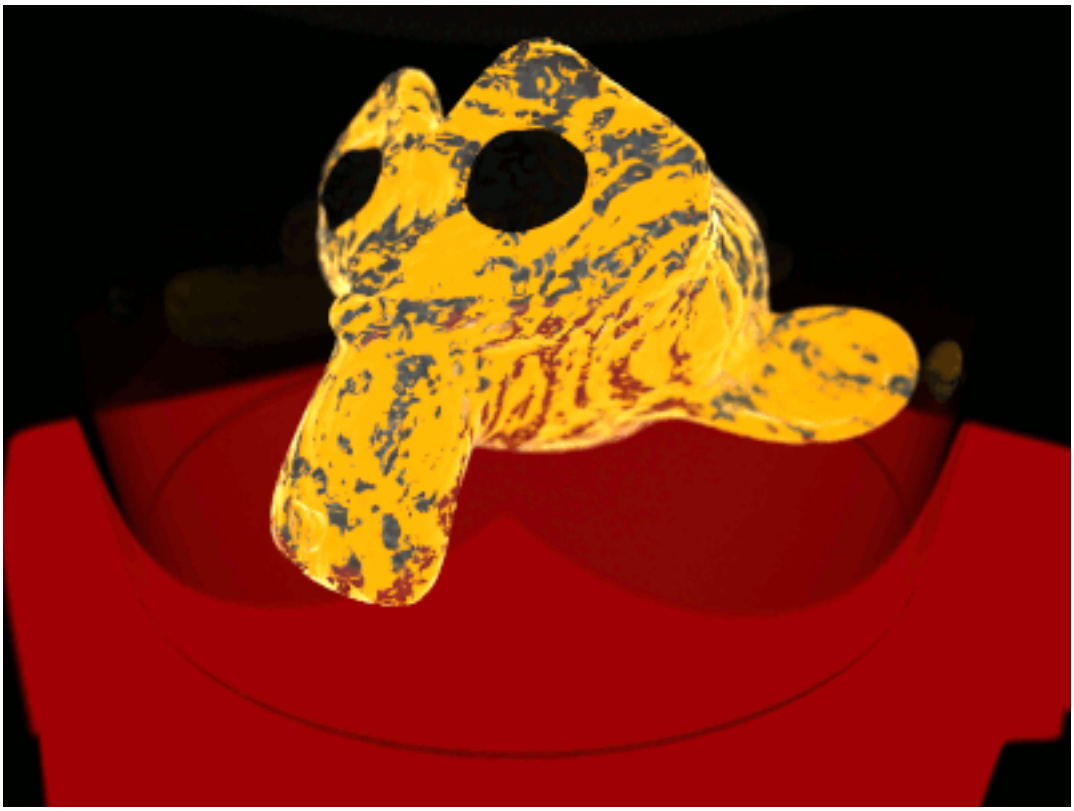

Abbildung 3.1 alt

Abbildungsverzeichnis

Quellcodeverzeichnis

Tabellenverzeichnis

Symbole

Abkürzungen

Akronyme

CLK Clock *siehe* SCL & SCK
SCK Serial Clock *siehe* SCL & CLK
SCL Serial Clock Line *siehe* SCK & CLK

Glossar

Rekursion

siehe Rekursion

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[FIG+99] Fielding, R.; Irvine, UC; Gettys, J.; Compaq/W3C; Mogul, J.; Compaq; Frystyk, H.; W3C/MIT; Masinter, L.; Xerox; Leach, P.; Microsoft; Berners-Lee, T. und W3C/MIT. *Hypertext Transfer Protocol – HTTP/1.1*. Juni 1999. URL: https://datatracker.ietf.org/doc/html/rfc2616.

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