

# **Phillip Schulze**

## **Curriculum Vitae**

### **2019**

# Phillip Schulze

## Curriculum Vitae

**Date of Birth:** 23 April 1999

### Contact Details

- 0730461177
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### Background

I was born in Dundee, KwaZulu-Natal, where I lived for 15 years. In 2014 I moved to Brits, North-West. I graduated matric in 2017 from Brits Hoërskool with 6 distinctions. In 2018 I started studying BSc Computer Science at the University of Pretoria and I am currently (2019) in my second year. I am also a resident of the Republic of Kollegetehuis, where I have been elected to the Executive Council for the 2019/2020 term.

### Leadership Roles

- In my matric year (2017) I was a High School prefect.
- In 2019 I have been elected to the Executive Council of the Republic of Kollegetehuis for the 2019/2020 term, where I am the First Year Guardian and Minister of Brotherhood.
- In 2019 I was part of a mentorship program within Kollegetehuis, where I served as mentor for the first-year BSc Computer Science students from Kollegetehuis 2019.

## **Matric Results**

- 6 distinctions
  - Information Technology - 92%
  - Computer Application Technology - 91%
  - Mathematics - 86%
  - Physical Science - 83%
  - English First Additional Language - 88%
  - Life Orientation - 89%
- Other Subjects
  - Afrikaans Home Language - 78%
  - Civil Technology (Extra Subject) - 76%
  - Alpha Mathematics (External) - 75%
- Computer programming Olympiad
  - Gold Medal in round 1 + Silver Medal in round 2 (2016 Gr11)
- Computer Talent Search
  - Gold Medal in the ELITE division (2017)

## **Work Experience**

- Protech PC's
  - Renier du Plooy
  - 0342182739
  - From 8 January 2019 to 29 January 2019
    - Computer repairs (hardware component replacements)
    - Computer clean up (removal of unnecessary/unwanted software)

# Programming Skills

- C++
  - Terminal applications
  - 2D Game Engines using SDL2 Library
  - C++/CLI WinForm Applications
  - multithreading
- Assembly (Intel 64-bit syntax)
  - Terminal applications
  - Basic + intermediate operations
- Java
  - Terminal applications
  - Android App Development
  - multithreading
- C#
  - Game Development using Unity game engine
  - WinForm Applications
- Delphi
  - GUI Applications + local database storage
- WebDev
  - HTML + CSS + JavaScript
    - HTTP-requests (JSON/XML)
  - PHP + MySQL/ NodeJS + MongoDB
    - RESTful APIs
    - Web Sockets
- Android
  - Java + XML
    - HTTP-requests (JSON)
    - Asynchronous tasks

# Projects

## 2D Game Engine

Github: [https://github.com/phillipstemmlar/2D\\_Game\\_Engine](https://github.com/phillipstemmlar/2D_Game_Engine)

This is a 2D game engine created in C++ and using the SDL2 library. It is created so that any basic 2D game can be created with it. It is used by inheriting from an abstract class called Game that runs all the necessary code to setup and run the game, in the background.

Game object classes also need to inherit from an abstract class called GameObject. This is the main class used by the engine to represent entities in the game world. Game objects consist of an entity-component model. This means that every game object has a list of components that determine its behaviour.

Some predefined components are:

- Animator Component
- Audio Component
- Collider Component
- Input Component
- Rigidbody Component
- Sprite Component
- Transform Component

Creating custom components is also possible and is done by inheriting from the abstract Component class.

The Game class delegates its work to manager objects that manage a certain set of objects. Some of the Manager objects are:

- Collision Manager that keeps track of all the collider components and checks for collisions among them.
- Event Manager that keeps track of an event queue and handles the events.
- GameObject Manager that keeps track of all the game objects and calls their update method.
- Input Manager that keeps track of all the Input Components and passes user input data to them.
- Music Manager that manages the music that the game plays.
- Render Manager that keeps track of all the Sprite Components and displays them to screen.

## Filmformation

Github: <https://github.com/phillipstemmlar/FilmFormation>

Filmformation is a movie database website. It allows you to search for a movie by name, and filter movies by genre and release year. It allows you to see the top rated movies, the new and upcoming movies and has a calendar that displays the movie release dates. The data is sourced from external API's.

The **frontend** consists of a Home page, Discover page, Latest page, Top Rated page and Calendar page. The Home page serves as a landing page and hub to all the other pages. The Discover page is used to search for a movie by name or filter through movies by genre and release year. The Latest page displays new and upcoming movies and a YouTube video trailer for each movie using iframes. The Top Rated page displays the top rated movies according to IMDB ratings. The Calendar page displays release dates and other useful information about upcoming movies in a grid formation. The Calendar also allows you to go back in time to see when older movies were released.

The pages are populated with movies using HTTP requests to my backend that responded with the resulting JSON data.

Users are able to sign up and log in to thus save their preferences when it comes to searching filters.

The **backend** was created using PHP and MySQL to store user data. Each page has a template header appended to the top and a template footer appended to the bottom.

The backend functionality consists of a RESTful API that receives HTTP request and returns the result as a JSON string. The API is encapsulated in a Singleton class so that each API request does not create a new instance. Each API request must include a valid API key of a registered user, otherwise no useful data will be returned.

When the API receives a HTTP request it determines what data is being requested. It then makes its own HTTP request using the CURL library to external API's where the movie data is sourced from.

The MySQL database functionality is also encapsulated in a Singleton class to ensure that all database requests are predefined.

When users sign up, their input data is validated using regular expressions, both on client and server side. An API key is then generated as a random hash code of a certain length. The user's password is salted and hashed. The user information is then stored in the database.

Filmformation also has an **Android Application** that works similarly to the website's discover page. You have to log in. Then it allows you to search for a movie and filter based on genre and year of release. These search preferences can then be saved and will then be used as the default search criteria.

The application was created using Java (and XML for layout) and was populated using HTTP request to the Filmformation API. HTTP requests were made using HttpURLConnection. These requests were made within a Java AsyncTask so that the requests are made asynchronously. A variety of combinations of Activities and Fragments were used.

## **Basic NodeJS WebSocket server**

Github: [https://github.com/phillipstemmlar/Basic\\_NodeJS-WebSocket\\_server](https://github.com/phillipstemmlar/Basic_NodeJS-WebSocket_server)

This is a WebSocket server created with NodeJS. This server demonstrates how to save a video's progress. Once the page is reloaded the video continues playing where it left off.

This server requires you to sign in with a Filmformation account details, and then establishes a web socket between the server and the client. The NodeJS server makes HTTP requests to the Filmformation API server.

## **Hotspot Application**

Github: <https://github.com/phillipstemmlar/HotspotApplication>

This is an Application that creates a wireless hotspot that shares an Ethernet connection. It was created using C++ and a library called C++/CLI that uses C++ to create WinForm applications. The core functionality behind this application is the "netsh" command prompt command. This application allows the user to specify a SSID and password and then creates a wireless hotspot network with those details. The details are then also saved to a file so that it can be restored when the application starts up.

## **Tic-tac-toe Game - WinForm**

Github: <https://github.com/phillipstemmlar/Tic-tac-toe>

This is a Tic-tac-toe game that was created with C#. It is played inside a WinForm application.

## **Tetris Game - Console Application**

Github: [https://github.com/phillipstemmlar/Tetris\\_Console\\_Game](https://github.com/phillipstemmlar/Tetris_Console_Game)

This is a Tetris game that was created with C++. It is played inside the console. It uses ASCII characters to draw the game.



# REPUBLIC OF SOUTH AFRICA

**STATEMENT OF RESULTS / STAAT VAN UITSLAE**  
**NATIONAL SENIOR CERTIFICATE / NASIONAAL SENIOR SERTIFIKAAT**  
**NOVEMBER 2017**

PHILLIP STEMMLAR SCHULZE

EXAMINATION NUMBER / EKSAMENNOMMER: 9171110200097  
ID NUMBER / ID NOMMER 9904235110081  
DATE OF BIRTH / GEBORTEDATUM 19990423  
CENTRE / SENTRUM: (9111020) BRITS HIGH SCHOOL

(1) BOJANALA PLATINUM DISTRICT NOORD WES DEPARTEMENT VAN ONDERWYS

Die kandidaat kwalifiseer vir die Nasionale Senior Sertifikaat en voldoen aan die minimum vereistes vir baccalaureus graad-, diploma of hoér sertifikaatstudie soos gepubliseer in die Staatskoerant vir toelating tot hoér onderwys.

ACTING HEAD OF DEPARTMENT  
WAARNEEMENDE HOOF VAN DEPARTEMENT

DATE / DATUM

2017/12/29

Achievement level Prestasievlek	Achievement Description Prestasiebeskrywing	Marks % Punte %
7	Outstanding achievement / Uitmuntende prestasie	80 - 100
6	Meritorious achievement / Verdienstelike prestasie	70 - 79
5	Substantial achievement / Beduidende prestasie	60 - 69
4	Adequate achievement / Voldoende prestasie	50 - 59
3	Moderate achievement / Matige prestasie	40 - 49
2	Elementary achievement / Basiese prestasie	30 - 39
1	Not achieved / Ontoereikende prestasie	0 - 29

DIE NASIONALE SENIOR SERTIFIKAAT SAL AAN DIE SKOOL GESTUUR WORD.

THE DEPARTMENT RESERVES THE RIGHT TO EFFECT CHANGES TO THIS DOCUMENT IF NECESSARY.

INDIEN NODIG BEHOU DIE DEPARTEMENT DIE REG OM WYSIGINGS AAN DIE DOKUMENT AAN TE BRING

# Wiskunde Mathematics

Sertifikaat

Certificate

Toegeken aan / Awarded to

Phillip Stemmlar Schulze

9904235110081

vir / for

Gevorderde Wiskunde

Advanced Mathematics\*

Uitslag / Result

75

B

Dr C Kriek

Me R Grobler

NOVEMBER 2017

\* See reverse / Sien keersy

## \*Kurrikulum

### Calculus:

- Differensiasie, ook van trigonometriese funksies
- Produk-, kwosiënt- en kettingreël by differensiasie
- Integrasie
- Toepassings van Integrasie en Differensiasie:
  - Newton-Rhapson metode om nulpunte te bepaal
  - Eienskappe van 1<sup>ste</sup> en 2<sup>de</sup> afgeleide
  - Oppervlakte onder grafieke
  - Volume van omwentelingsliggaam
  - Inverse Trigonometriese Funksies met radiaalmaat

### Algebra:

- Ontbinding van polinome
- Absolute waarde
- Skets van rasionale funksies
- Matrikse
- Binomiaalstelling
- Komplekse getalle

## \*Curriculum

### Calculus:

- Differentiation, including trigonometric functions
- Product-, quotient- and chain rule for differentiation
- Integration
- Applications of differentiation and integration:
  - Newton-Rhapson method to calculate zeros
  - Characteristics of 1<sup>st</sup> and 2<sup>nd</sup> derivatives.
  - Area under graphs
  - Volume of solids of revolution
  - Inverse of trigonometric functions and radial measure

### Algebra:

- Factorisation of polynomials
- Absolute values
- Sketching of rational functions
- Matrices
- Binomial theorem
- Complex numbers



# Computer Talent Search

This is to certify that

**Phillip Schulze**

from

**Brits Hoër**

earned a **Gold** certificate

in the **ELITE** division  
of the 2017 Talent Search

Principal



Administrator

A Project of the Institute of IT Professionals South Africa.  
Sponsored by Standard Bank.





# Computer Programming Olympiad

This is to certify that

**Phillip Schulze**

from

**Brits Hoëskool**

earned a **Silver** certificate

in the *Grade 11* division  
of the  
**2016 Programming Olympiad**

Principal



Teacher

A project of the Institute of IT Professionals South Africa



**ORACLE** ACADEMY



Sponsored by Standard Bank.  
Supported by Oracle Academy and the University of Cape Town.



UNIVERSITEIT VAN PRETORIA  
UNIVERSITY OF PRETORIA  
YUNIBESITHI YA PRETORIA

**DEPARTMENT OF STUDENT AFFAIRS**

hereby awards a

*Certificate of Achievement*

to

**Phillip Schulze**

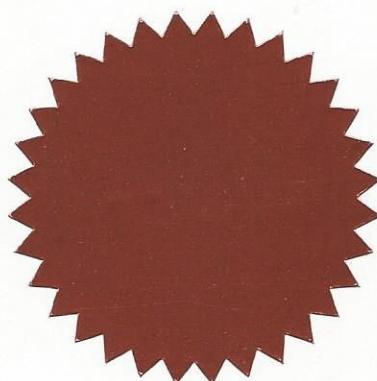
*For active participation in  
the College Mentorship Programme*



Head: Student Development



2019



# The Republic of College

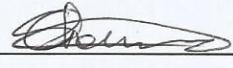
## Oath of Citizenship

Witnessed by this Assembly, and in full recognition of the high office that I, as a citizen of the Republic, take in the service of the

Republic, I

Philip Schulze

promise that I will be true to the Republic of College;  
give my solemn word that I will promote at all times  
that which will benefit the Republic;  
that I will reject all that could harm the Republic;  
that I will honour, maintain and support the Constitution of the  
Republic;  
that I will perform my duties faithfully,  
using all my strengths and talents,  
to the best of my ability and knowledge,  
true to my conscience;  
that I will be just to all  
and that I will dedicate myself to the well-being of the Republic and  
its people.

  
State President

  
State Secretary

  
Appeal Judge