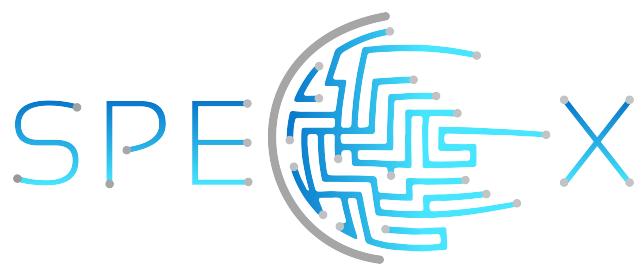

SPECX v3.2

User Guide



Copyright (C) 2020, Team SpecX

Team SpecX, 2017-2020

Bilal Wajid
 Momina Jamil
 Hasan Iqbal
 Imran Wajid
 Khalid Waheed
 Mustafa Kamal AlShawaqfeh
 Ali Riza Ekti
 Muhammad Atyab Imtaar
 Ali Boyaci
 Serhan Yarkan
 Sabit Ekin

SpecX v3.2 User Guide

This program is free software: you can redistribute it and/or modify it under the terms of the GNU Affero General Public License v3.0 as published by the Free Software Foundation, either version 3 of the License, or (at your option) any later version.

This program is distributed in the hope that it will be useful, but WITHOUT ANY WARRANTY; without even the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU Affero General Public License for more details.

You should have received a copy of the GNU Affero General Public License along with this program. If not, see: <https://www.gnu.org/licenses/>

Disclaimer of Warranty:

THERE IS NO WARRANTY FOR THE PROGRAM, TO THE EXTENT PERMITTED BY APPLICABLE LAW. EXCEPT WHEN OTHERWISE STATED IN WRITING THE COPYRIGHT HOLDERS AND/OR OTHER PARTIES PROVIDE THE PROGRAM "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING,

BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE ENTIRE RISK AS TO THE QUALITY AND PERFORMANCE OF THE PROGRAM IS WITH YOU. SHOULD THE PROGRAM PROVE DEFECTIVE, YOU ASSUME THE COST OF ALL NECESSARY SERVICING, REPAIR OR CORRECTION.

Limitation of Liability:

IN NO EVENT UNLESS REQUIRED BY APPLICABLE LAW OR AGREED TO IN WRITING WILL ANY COPYRIGHT HOLDER, OR ANY OTHER PARTY WHO MODIFIES AND/OR CONVEYS THE PROGRAM AS PERMITTED ABOVE, BE LIABLE TO YOU FOR DAMAGES, INCLUDING ANY GENERAL, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THE PROGRAM (INCLUDING BUT NOT LIMITED TO LOSS OF DATA OR DATA BEING RENDERED INACCURATE OR LOSSES SUSTAINED BY YOU OR THIRD PARTIES OR A FAILURE OF THE PROGRAM TO OPERATE WITH ANY OTHER PROGRAMS), EVEN IF SUCH HOLDER OR OTHER PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

Trademarks:

Sabz Qalam and the "feather" logo are registered trademarks of Sabz Qalam. All other marks are property of their respective owners.

Department of Information Technology
 Sabz Qalam
 6 Lodge Road, Old Anarkali
 Lahore, Pakistan

REF SX-102

Acknowledgment:

This work has been supported by Sabz-Qalam via grant SQ-2020-ITEDU.



Sabz-Qalam is Pakistan's Premier Data Science Research Institute and its Department of Information Technology currently working in IT consulting, software development, testing and support.

Department of Information Technology
Sabz Qalam
6 Lodge Road, Old Anarkali
Lahore, Pakistan

Contents

About SpecX	1
Abstract	1
Purpose	1
Intended Audience	1
Required Background	1
How This Guide is Organized	2
Contact	2
 SpecX Package	 3
SpecX ECE Curriculum based Categorization Scheme	3
Software Selection Criteria	6
SpecX Packaged Tools	14
 Software Installation Process	 19
Installing SpecX software	19
 Microsoft Windows Support	 31
Installing SpecX software on Microsoft Windows	31
 macOS Support	 41
Installing SpecX software on macOS	41

About SpecX

Abstract

SpecX is a free, easily distributable software installation package for freeware tools for electrical/electronic and computer engineering (ECE) students.

SpecX is a Linux-based software package that facilitate easy download and installation of a wide range of tools for programming, circuit analysis, printed circuit board design, mathematical and numerical analysis, network analysis. It also downloads the dependencies prior to the tools for which they are required. SpecX provides an interactive graphical user interface which is easily understandable for users unaware of UNIX-shell language.

SpecX is free and effective alternative to the existing costly and copyrighted software packages and it attempts to reduce the duplication of efforts on building software workstations in laboratories and is intended to serve as a good teaching resource in a classroom setting.

Purpose

The basic purpose of this document is to provide the complete description about the installation of SpecX. Running SpecX on Microsoft Windows through Virtualization is also explained.

Intended Audience

SpecX is aimed at universities and students as it represents a cohesive environment integrating more than 200 software all catering to undergraduate and graduate coursework offered in ECE and Computer Science (CS) programs.

Required Background

Team SpecX has made every attempt to make this a step by step guide. However, some familiarity with Linux operating system as well as software and hardware requirements of SpecX are assumed.

How This Guide is Organized

This guide is organized into sections grouped according to the intended use by the user:

- About This Guide (Chapter 1) describes this document's purpose and intended audience
- SpecX Package (Chapter 2) has tables for Software Categorization Scheme, Selection Criteria and Included Tools
- Software Installation Process (Chapter 3) describes how to install SpecX
- Microsoft Windows Support (Chapter 4) and MacOS Support (Chapter 5) describes a step by step procedure to configure a virtual OS for SpecX on Windows and MacOS respectively

Contact

For any further queries and suggestions, contact us at: mominaj05@gmail.com or hasaniqbal777@gmail.com

SpecX Package

SpecX ECE Curriculum based Categorization Scheme

The authors established a categorizations scheme by which all the courses of ECE curriculum are sorted in eight broad categories shown in the following Table. Each category is assigned a category code for the sake of brevity.

Sr. No.	ECE Category	Code
1	Mathematical and Numerical Analysis	MN
2	Programming	PROG
3	Circuit Analysis and PCB Design	CPCB
4	Power Systems	PS
5	Embedded Systems	EMBD
6	Networking	NET
7	Communication Systems	COMM
8	Technical Writing and Presentation	TWP

Following Table gives a standard ECE curriculum along with the respective codes of broad categories established previously to make it easier for faculty and students to locate their relative course and category.

Yr.	ECE Curriculum Course	Category
Freshman Year	Electric Circuit Theory	CPCB
	Calculus	MN
	Computer Fundamentals	PROG
	Multivariate Calculus	MN
	Communication Skills	TWP

	Differential Equations	MN
Sophomore Year	Semiconductor Devices	CPCB
	Programming Fundamentals	PROG
	Digital System Design	CPCB
	Object Oriented Programming	PROG
	Technical Writing and Presentation	TWP
	Linear Algebra	MN
	Analog and Digital Circuits	CPCB
	Signals and Systems	MN/CPCB
	Discrete Mathematical Structures	MN
	Data Structures and Algorithms	PROG
	Microprocessor Systems	EMBD
	Numerical Methods	MN
Junior Year	Applied Probability and Statistics	MN
	Control Systems	MN/EMBD
	Electric Machinery Fundamentals	PS
	Electromagnetic Theory	COMM
	Analog and Digital Communications	COMM
	Digital Signal Processing	MN/COMM
	Introduction to Robotics	EMBD
	Power Transmission and Distribution	PS
	Operating Systems	PROG
	Antenna Systems	COMM
Senior Year	Power System Analysis and Design	PS
	Power Electronics	CPCB/PS
	Integrated Electronic Circuits	CPCB
	Industrial Electronics	CPCB
	Satellite Engineering	COMM
	Wireless Communications	COMM
	Digital Image Processing	MN/PROG

Senior Year	Computer Networks	NET
	Database Engineering	PROG
	Introduction to Machine Learning	PROG
	High Voltage Engineering	PS
	Renewable Energy Systems	PS
	Design of Electrical Machines	PS
	Power System Protection	PS
	Introduction to Smart Grids	PS
	Computer Architecture	EMBD
	Introduction to VLSI Design	CPCB
	Software Construction	PROG
	Optical Circuits and Systems	COMM
	Artifical Intelligence	PROG
	Microwave Engineering	COMM
	Electromagnetic Compatibility	COMM
	Electrical Instruments	CPCB
	Project Management	TWP
	Thesis Writing (Capstone Project)	TWP

Software Selection Criteria

A specific criteria is used for enclosure of tools in SpecX. Table shows this selection criteria. Softwares which are included are due to these specific reasons:

- Publication Date (later then 2010)
- Freeware License
- Linux based
- Offline

Sr. no	Software Tool Name	Pub. Date (2010-)	Offline	Linux based	Free	Installed
Mathematical and Numerical Analysis (MN)						
Mathematical Analysis						
1	GNU Octave[1]	✓	✓	✓	✓	✓
2	Maple[2]	✓	✓	✓		
3	wxMaxima[3]		✓	✓	✓	
4	Mathematica[4]	✓		✓		
5	GraphMonkey[5]		✓	✓	✓	
6	Mathworks MATLAB[6]	✓	✓	✓		
7	SageMath[7]	✓	✓	✓	✓	✓
8	mathomatic[8]		✓	✓	✓	
9	Kig[9]		✓	✓	✓	
10	Scilab[10]	✓	✓	✓	✓	✓
11	OpenEuclide[11]		✓	✓	✓	
12	gretl[12]	✓	✓	✓	✓	✓
13	GeoGebra[13]	✓	✓	✓	✓	✓
14	PSPP[14]	✓	✓	✓	✓	✓
15	Frink[15]		✓		✓	
16	SMathStudio[16]	✓	✓	✓	✓	✓
17	Tilip[17]	✓	✓	✓	✓	✓
18	OenEPI[18]	✓	✓	✓	✓	✓
19	Shogun[19]	✓	✓	✓	✓	✓
20	HippoDraw[20]		✓	✓	✓	
Finite Element Analysis						
21	Agros2D[21]	✓	✓	✓	✓	✓
22	Analysis3D[22]	✓	✓		✓	
23	Calculix [23]	✓	✓	✓	✓	✓
24	CodeAster [24]	✓	✓	✓	✓	✓
25	DIANAFEA [25]	✓	✓	✓		
26	deal.II [26]	✓	✓	✓	✓	✓
27	DUNE [27]	✓	✓	✓	✓	✓
28	Elmer [28]	✓	✓	✓	✓	✓
29	F Enics Project [29]	✓	✓	✓	✓	✓
30	FEA Tool Multiphy. [30]	✓	✓	✓		
31	Femap [31]	✓	✓			
32	FreeFem++ [32]	✓	✓	✓	✓	✓
33	GiD [33]	✓	✓	✓	✓	✓
34	Get FEM++ [34]	✓	✓	✓	✓	✓
35	Hermes Project [35]	✓	✓	✓	✓	✓
36	Julia FEM [36]	✓	✓	✓	✓	✓
37	MFEM [37]	✓	✓	✓	✓	✓
38	MoFEM JosePH [38]	✓	✓	✓	✓	✓
39	OO嫵EM [39]	✓	✓	✓	✓	✓
40	Open FOAM [40]	✓	✓	✓	✓	✓
41	Open Sees [41]	✓	✓	✓		
42	Range Software [42]	✓	✓	✓	✓	✓
43	288/288 Aurora[43]		✓	✓	✓	
44	Abaqus [44]	✓	✓		✓	

45	CONSELF [45]	✓	✓		✓	
46	Free CAD [46]	✓	✓	✓	✓	✓
47	HyperMesh[47]		✓	✓		
48	Advance Design[48]	✓	✓			
49	Autodesk Simulation[49]	✓	✓		✓	
50	ANSYS [50]	✓	✓			
51	KEY CREATER[51]	✓	✓		✓	
52	COMSOL Multiphy.[52]	✓	✓	✓		
53	Cosmos Works[53]		✓		✓	
54	Quick Field[54]	✓	✓		✓	
55	LS-DYNA [55]	✓	✓	✓		
56	MecWay [56]	✓	✓		✓	
57	Nastran [57]	✓	✓	✓		
58	RFEM [58]	✓	✓		✓	
59	SimScale [59]	✓	✓		✓	
60	Visual FEA [60]	✓	✓		✓	
61	JCM suite [61]	✓	✓	✓		
62	CAEplex [62]	✓	✓		✓	
63	JMAG [63]	✓	✓	✓		
Programming (PROG)						
C/C++ Development						
64	Visual Studio[64]	✓	✓		✓	
65	Code::Blocks[65]	✓	✓	✓	✓	✓
66	NetBeans C/C++ pack[66]	✓	✓	✓	✓	✓
67	Qt Creator[67]	✓	✓	✓	✓	✓
68	C++Builder[68]	✓	✓			
69	CodeLite[69]	✓	✓	✓	✓	✓
70	Dev-C++[70]		✓		✓	
71	Eclipse IDE (C/C++)[71]	✓	✓	✓	✓	✓
72	GNAT Studio[72]	✓	✓	✓		
73	Oracle Solaris Studio[73]	✓	✓	✓		
74	JetBrains Clion[74]	✓	✓	✓		
75	Kdevelop (C/C++)[66]	✓	✓	✓	✓	✓
76	Rational Soft. Arch. [75]	✓	✓	✓		
77	Ultimate++ the IDE[76]	✓	✓	✓	✓	✓
78	Understand (C/C++)[77]	✓	✓	✓		
79	Anjuta[78]	✓	✓	✓	✓	✓
C# and Visual Basic Development						
80	Visual Studio[79]	✓	✓		✓	
81	MonoDevelop[80]	✓	✓	✓	✓	✓
82	Sharp Develop[81]	✓	✓		✓	
83	Understand (C#)[82]	✓	✓	✓		
84	Xamarin Studio[83]	✓	✓	✓		
85	Rider[84]	✓	✓	✓		
JAVA Development						
86	BlueJ[85]	✓	✓	✓	✓	✓
87	NetBeans JAVA pack[86]	✓	✓	✓	✓	✓
88	Dr Java[87]	✓	✓	✓	✓	✓
89	Eclipse IDE (JAVA)[88]	✓	✓	✓	✓	✓
90	Greenfoot[89]	✓	✓	✓	✓	✓
91	IntelliJ IDEA Com.[90]	✓	✓	✓	✓	✓
92	JBuilder[91]		✓	✓		
93	JCreator[92]	✓	✓		✓	
94	Oracle Jdeveloper[93]	✓	✓	✓		
95	jGRASP[94]	✓	✓	✓	✓	✓
96	MyEclipse[95]	✓	✓	✓		
97	Servoy[96]	✓	✓	✓		
98	Understand (JAVA)[97]	✓	✓	✓		
Python Development						
99	IDLE[98]	✓	✓	✓	✓	✓
100	PyCharm[99]	✓	✓	✓	✓	✓
101	Wing Python IDE[100]		✓	✓	✓	

SpecX v3.2

I02	Eric[I01]	✓	✓	✓	✓	✓
I03	Komodo (Python)[I02]	✓	✓	✓		
I04	KDevelop (Python)[I03]	✓	✓	✓	✓	✓
I05	NINJA-IDE[I04]	✓	✓	✓	✓	✓
I06	PyDev (Eclipse)[I05]	✓	✓		✓	
I07	Anaconda[I06]	✓	✓	✓	✓	✓
I08	Pyzo[I07]	✓	✓	✓	✓	✓
I09	PyScripter[I08]	✓	✓		✓	
I10	Thonny[I09]	✓	✓	✓	✓	✓
I11	Understand (Python)[I10]	✓	✓			
Ruby Development						
I12	Aptana Studio 3[I11]	✓	✓	✓	✓	✓
I13	RubyMine[I12]	✓	✓	✓		
I14	Eclipse[I13]	✓	✓		✓	
I15	Komodo IDE (Ruby)[I13]	✓	✓	✓		
I16	NetBeans (Ruby)[I14]	✓	✓	✓	✓	✓
Tcl/Tk Development						
I17	Eclipse DLTK[I15]	✓	✓		✓	
I18	Komodo IDE[I16]	✓	✓	✓		
I19	VTCL[I17]	✓	✓	✓	✓	✓
Perl Development						
I20	Eclipse EPIC[I18]		✓	✓	✓	
I21	KomodoIDE[I16]	✓	✓	✓		
I22	NetBeans (Perl)[I86]	✓	✓	✓	✓	✓
I23	Padre - the Perl IDE[I19]		✓	✓	✓	
I24	PerlEdit[I20]		✓	✓	✓	
HTML/CSS/Javascript Development						
I25	Adobe Dreamweaver[I21]	✓	✓		✓	
I26	Brackets[I22]	✓	✓	✓	✓	✓
I27	WebStorm[I23]	✓	✓	✓		
I28	Aptana Studio 3[I11]	✓	✓	✓	✓	✓
I29	Eclipse WTP[I24]	✓	✓	✓	✓	✓
I30	NUVU[I25]		✓	✓	✓	
I31	Sea Monkey[I26]	✓	✓	✓	✓	✓
I32	Amaya [I27]	✓	✓	✓	✓	✓
I33	KompoZer [I28]	✓	✓	✓	✓	✓
I34	BlueGriffon[I29]	✓	✓	✓	✓	✓
I35	Quanta Plus [I30]		✓	✓	✓	
I36	NetBeans packs[I86]	✓	✓	✓	✓	✓
PHP Development						
I37	Eclipse PDT[I31]	✓	✓	✓	✓	✓
I38	Visual Studio[I32]	✓	✓			
I39	PhpED Professional[I33]	✓	✓		✓	
I40	PHPStorm[I34]	✓	✓	✓		
I41	Rad PHP[I35]		✓		✓	
I42	ZendStudio[I36]	✓	✓	✓		
DBMS Development						
I43	MySQL Workbench[I37]	✓	✓	✓	✓	✓
I44	phpMy Admin[I38]	✓	✓	✓	✓	✓
I45	HeidiSQL[I39]	✓	✓		✓	
I46	Adminer[I40]	✓	✓	✓	✓	✓
I47	Navicat[I41]		✓	✓		
I48	Oracle SQL Dev.[I42]	✓	✓	✓		
I49	DBeaver[I43]	✓	✓	✓	✓	✓
I50	Maria DB[I44]	✓	✓	✓	✓	✓
I51	SQLite[I45]	✓	✓	✓	✓	✓
I52	MySQL by EngInSite[I46]	✓	✓			
I53	dbForge Studio[I47]	✓	✓		✓	
I54	DBTools Manager[I48]	✓	✓			
I55	Percona Toolkit[I49]	✓	✓	✓	✓	✓
I56	SQLyog[I50]	✓	✓			
I57	DBVisualizer[I51]	✓	✓	✓	✓	✓

158	Jack DB[152]	✓	✓	✓		
159	Datazenit[153]	✓	✓	✓		
160	xBaseView Database[154]	✓	✓			
161	SQL Examiner Suite[155]	✓	✓			
162	MyDB Studio[156]	✓	✓		✓	
163	Razor SQL[157]	✓	✓			
164	Sequel Pro[158]	✓	✓		✓	
CLISP Development						
165	Portacle[159]	✓	✓	✓	✓	✓
166	Vanilla Lisp Shell[160]		✓	✓	✓	
167	Lispbox[161]	✓	✓	✓	✓	✓
168	LispWorks[162]	✓	✓	✓		
169	GNU Emacs (CLISP)[163]	✓	✓	✓	✓	✓
170	Lispstick[164]	✓	✓		✓	
171	SLIME[165]		✓	✓	✓	
172	Quick Lisp[166]		✓	✓	✓	
173	SBCL[167]	✓	✓	✓	✓	✓
174	GNU Zile[168]	✓	✓	✓	✓	✓
175	Xemacs[169]	✓	✓	✓	✓	✓
176	Emacspeak[170]	✓	✓	✓	✓	✓
177	JOVE[171]		✓	✓	✓	
R Development						
178	RStudio[172]	✓	✓	✓	✓	✓
179	RKWard[173]	✓	✓	✓	✓	✓
Code Editors						
180	Sublime Text[174]	✓	✓	✓	✓	✓
181	Notepad++[175]	✓	✓		✓	
182	Atom[176]	✓	✓	✓	✓	✓
183	Coda[177]	✓	✓		✓	
184	Visual Studio Code[178]	✓	✓	✓	✓	✓
185	Vim[179]	✓	✓	✓	✓	✓
186	jEdit[180]	✓	✓	✓	✓	✓
187	Araneae[181]	✓	✓		✓	
188	UltraEdit[182]	✓	✓	✓		
189	BlueFish[183]	✓	✓	✓	✓	✓
190	Brackets[184]	✓	✓	✓	✓	✓
191	Komodo Edit[185]	✓	✓	✓	✓	✓
192	TextWrangler[186]	✓	✓		✓	
193	Geany[187]	✓	✓	✓	✓	✓
194	SlickEdit[188]	✓	✓	✓		
195	JED[189]	✓	✓	✓	✓	✓
196	GNU nano[190]	✓	✓	✓	✓	✓
197	GNU Emacs[191]	✓	✓	✓	✓	✓
Compilers						
198	GCC GNAT (ADA)[192]	✓	✓	✓	✓	✓
199	NASM (Intel *86)[193]	✓	✓	✓	✓	✓
200	FreeBASIC (BASIC)[194]	✓	✓	✓	✓	✓
201	GNU Compilers (C/C++)[195]	✓	✓	✓	✓	✓
202	Mono (C#)[196]	✓	✓	✓	✓	✓
203	GnuCOBOL (COBOL)[197]	✓	✓	✓	✓	✓
204	javac (JAVA)[198]	✓	✓	✓	✓	✓
205	ActivePerl interpreter (Perl)[199]	✓	✓	✓	✓	✓
206	python (Python)[200]	✓	✓	✓	✓	✓
207	ActiveTcl (Tcl/TK)[201]	✓	✓	✓	✓	✓
208	ruby (Ruby)[202]	✓	✓	✓	✓	✓
209	r-base[203]	✓	✓	✓	✓	✓
Circuit Analysis and PCB Design (CPCB)						
Schematic and PCB Design						
210	Altium[204]	✓	✓			
211	Eagle[205]	✓	✓	✓		
212	FidoCadJ[206]	✓	✓	✓	✓	✓
213	Visolate[207]		✓	✓	✓	

214	gerbv[208]	✓	✓	✓	✓	✓
215	kicad[209]	✓	✓	✓	✓	✓
216	PCB Layout Tool[210]		✓	✓	✓	
Protoboard Viewer						
217	Fritzing[211]	✓	✓	✓	✓	✓
Schematic and Circuit Simulator						
218	Proteus Design Suite[212]	✓	✓			
219	SimulIDE[213]	✓	✓	✓	✓	✓
220	gEDA[214]	✓	✓	✓	✓	✓
221	QUCS[215]		✓	✓	✓	
222	Ktechlab[216]		✓	✓	✓	
Integrated Synthesis Environment (ISE)						
223	Xilinx ISE[217]	✓	✓			
224	ModelSim[218]	✓	✓	✓		
225	Icarus Verilog[219]	✓	✓	✓	✓	✓
226	HADES[220]	✓	✓	✓	✓	✓
Very-large-scale integration (VLSI)						
227	Electric[221]	✓	✓	✓	✓	✓
228	Magic VLSI[222]	✓	✓	✓	✓	✓
Simulation Program with Integrated Circuit Emphasis (SPICE)						
229	NI Multisim[223]	✓	✓			
230	OrCAD PSpice[224]	✓	✓		✓	
231	Oregano[225]	✓	✓	✓	✓	✓
232	ngspice[226]	✓	✓	✓	✓	✓
233	LTS spice[227]	✓	✓		✓	
234	gspiceui[228]	✓	✓	✓	✓	✓
235	GNU-Cap[229]	✓	✓	✓	✓	✓
236	Gwave[230]	✓	✓	✓	✓	✓
237	GTKWave[231]	✓	✓	✓	✓	✓
238	Tina-TI[232]	✓	✓			
239	QSApecNG[233]	✓	✓	✓	✓	✓
240	NetlistViewer[234]	✓	✓	✓	✓	✓
241	Eniac[235]		✓	✓	✓	
242	Spice++[236]		✓	✓	✓	
243	LCSIM[237]		✓	✓	✓	
244	SpiceX[238]		✓	✓	✓	
Power Systems (PS)						
245	ETAP [239]	✓	✓			
246	GridLAB-D[240]	✓	✓	✓	✓	✓
247	PyPSA[241]	✓	✓	✓	✓	✓
248	PowerWorld[242]	✓	✓		✓	
249	GridSim[243]		✓	✓	✓	
250	Penthode[244]	✓	✓	✓	✓	✓
251	RAPSIM[245]	✓	✓	✓	✓	✓
252	Python Power Electronics[246]	✓	✓	✓	✓	✓
253	Power System Toolbox[247]		✓	✓	✓	
Embedded Systems (EMBD)						
PIC Development Tools						
254	MPLAB[248]	✓	✓	✓	✓	✓
255	SDCC[249]	✓	✓	✓	✓	✓
256	mikroC for PIC[250]	✓	✓			
257	PICSimLab[251]	✓	✓	✓	✓	✓
258	gputils[252]	✓	✓	✓	✓	✓
259	Flowcode for PIC[253]	✓	✓		✓	
ARM Development Tools						
260	Keil uVision MDK-ARM[254]	✓	✓		✓	
261	mikroC for ARM[255]	✓	✓			
262	Code Composer Studio[256]	✓	✓	✓	✓	✓
263	Eclipse MCU[257]	✓	✓	✓	✓	✓
264	DENX ELDK[258]		✓	✓	✓	
265	Flowcode for ARM[259]	✓	✓		✓	
Arduino Development Tools						

266	Arduino IDE[260]	✓	✓	✓	✓	✓
267	Processing IDE[261]	✓	✓	✓	✓	✓
AVR Development Tools						
268	AVR toolchain[262]	✓	✓	✓	✓	✓
269	simuavr[263]	✓	✓	✓	✓	✓
270	KontrollerLab[264]		✓	✓	✓	
8051 Development Tools						
271	Keil uVision C5I[265]	✓	✓		✓	
272	MCU 8051 IDE[266]	✓	✓	✓	✓	✓
273	GNU 8051 Simulator[267]	✓	✓	✓	✓	✓
274	SDCC[249]	✓	✓	✓	✓	✓
Texas Instruments Development Tools						
275	Energia[268]	✓	✓	✓	✓	✓
RISC-V Development Tools						
276	RISCV-VP[269]	✓	✓	✓	✓	✓
277	FireSim[270]	✓	✓	✓		
278	Imperas[271]	✓	✓	✓		
279	jorik[272]	✓	✓	✓		
280	jupiter[273]	✓	✓	✓	✓	✓
281	renode[274]	✓	✓	✓	✓	✓
282	rars[275]	✓	✓	✓	✓	✓
283	pqse[276]	✓	✓	✓		
284	VLAB Works[277]	✓	✓	✓		
285	Eclipse MCU[278]	✓	✓	✓	✓	✓
MIPS Development Tools						
286	MARS[279]	✓	✓	✓	✓	✓
287	spim[280]	✓	✓	✓	✓	✓
Networking (NET)						
Network Design Software						
288	Solarwinds Network Design[281]	✓	✓	✓		
289	Edraw[282]	✓	✓	✓	✓	✓
Network Simulation Software						
290	Packet Tracer[283]	✓	✓	✓	✓	✓
291	Gns3[284]	✓	✓	✓	✓	✓
292	Wireshark[285]	✓	✓	✓	✓	✓
293	Dynamips[286]		✓		✓	
294	tcpdump[287]	✓	✓	✓	✓	✓
295	WinPcap[288]	✓	✓		✓	
Network Monitoring Software						
296	Solarwinds Network Monitor[289]	✓	✓		✓	
297	Paessler PRTG[290]	✓	✓		✓	
298	Icinga 2[291]	✓	✓	✓	✓	✓
299	Nagios Core[292]	✓	✓	✓		
300	Spiceworks[293]	✓	✓		✓	
301	Zenoss Core[294]	✓	✓	✓		
302	Zabbix[295]	✓	✓	✓	✓	✓
Communication Systems (COMM)						
Electromagnetic (EM) Simulation						
303	Momentum 3D EM Sim.[296]	✓	✓			
304	Altair FEKO[297]	✓	✓			
305	Advanced Design System[298]	✓	✓			
306	gprMax[299]	✓	✓	✓	✓	✓
307	Angora[300]	✓	✓	✓	✓	✓
308	emGine Environment[301]	✓	✓		✓	
Antenna Design and Simulation						
309	ANSYS HFSS[302]	✓	✓			
310	4nec2[303]	✓	✓		✓	
311	NEC2[304]	✓	✓		✓	
312	MMANA-GAL[305]	✓	✓		✓	
313	EMCoS Antenna VLab[306]	✓	✓		✓	
314	Meep[307]	✓	✓	✓	✓	✓
315	openEMS[308]	✓	✓	✓	✓	✓

SpecX v3.2

316	MaxFEM[309]	✓	✓	✓	✓	✓
317	FEMM[310]	✓	✓		✓	
Technical Writing and Presentation Skills (TWP)						
Document Preparation Systems						
318	TeX Live[311]	✓	✓	✓	✓	✓
319	TeXstudio[312]	✓	✓	✓	✓	✓
320	TeXmaker[313]	✓	✓	✓	✓	✓
321	Gummi[314]	✓	✓	✓	✓	✓
322	Lyx[315]	✓	✓	✓	✓	✓
323	GNU TeXmacs[316]	✓	✓	✓	✓	✓
324	Halibut[317]	✓	✓	✓	✓	✓
325	Notabene[318]	✓	✓	✓		
Word Processor						
326	Microsoft Office Word[319]	✓	✓		✓	
327	LibreOffice Writer[320]	✓	✓	✓	✓	✓
328	WPS Office Writer[321]	✓	✓	✓	✓	✓
329	AbiWord[322]	✓	✓	✓	✓	✓
330	Scrivener[323]	✓	✓	✓		
331	CalligraWords[324]	✓	✓	✓	✓	✓
Spreadsheet Editor						
332	Microsoft Office Excel[325]	✓	✓		✓	
333	LibreOffice calc[326]	✓	✓	✓	✓	✓
334	WPS Office Spreadsheets[327]	✓	✓	✓	✓	✓
335	Gnumeric[328]	✓	✓	✓	✓	✓
336	Pyspread[329]	✓	✓	✓	✓	✓
337	CalligraSheets[324]	✓	✓	✓	✓	✓
Presentation Program						
338	Microsoft Office Powerpoint[330]	✓	✓		✓	
339	LibreOffice Impress[331]	✓	✓	✓	✓	✓
340	WPS Office Presentations[321]	✓	✓	✓	✓	✓
341	Beamer[332]	✓	✓	✓		
342	Whyte Board[333]		✓	✓	✓	
343	CalligraStage[324]	✓	✓	✓	✓	✓
Diagram/Flowchart						
344	Microsoft Office Visio[334]	✓	✓			
345	LibreOffice Draw[335]	✓	✓	✓	✓	✓
346	Dia[336]	✓	✓	✓	✓	✓
347	yEd[337]	✓	✓	✓	✓	✓
348	Edraw Flowchart Software[338]	✓	✓	✓	✓	✓
Reference and Citation						
349	Zotero[339]	✓	✓	✓	✓	✓
350	JabRef[340]	✓	✓	✓	✓	✓
351	KBibTeX[341]	✓	✓	✓	✓	✓
352	BibDesk[342]	✓	✓		✓	
353	Referencer[343]	✓	✓	✓	✓	✓
Project Management						
354	Git[344]	✓	✓	✓	✓	✓
355	GitKraken[345]	✓	✓	✓	✓	✓
356	TaskJuggler[346]	✓	✓	✓	✓	✓
357	Gantt Project[347]	✓	✓	✓	✓	✓
358	mishra2013software[348]		✓	✓	✓	
359	Jira[349]	✓	✓	✓		
Printable Schematic Design						
360	CircuiTikZ[350]	✓	✓	✓	✓	✓
361	XCircuit[351]	✓	✓	✓	✓	✓
Utilities and Plugins						
Virtual Machines (VMs)						
362	VirtualBOX[352]	✓	✓	✓	✓	✓
363	Vmware[353]	✓	✓		✓	
364	Parallels Desktop[354]	✓	✓	✓		
365	QEMU[355]	✓	✓	✓	✓	✓
Other Virtualization						

366	ttyOtty[356]	✓	✓	✓	✓	✓
367	socat[357]	✓	✓	✓	✓	✓
Serial Monitor						
368	TeraTerm Pro[358]	✓	✓		✓	
369	PuTTY[359]	✓	✓	✓	✓	✓
Calculator						
370	SpeedCrunch[360]	✓	✓	✓	✓	✓
371	Generic Mapping Tools[361]	✓	✓	✓	✓	✓
372	Qalculate[362]	✓	✓	✓	✓	✓
373	GNOME Calculator[363]	✓	✓	✓	✓	✓
Unit Converter						
374	Convert[364]	✓	✓	✓	✓	✓
375	ConvertAll[365]	✓	✓	✓	✓	✓
376	MultiConvert[366]	✓	✓	✓	✓	✓
377	Convert for Windows[367]	✓	✓		✓	
Help and Learning Resources						
378	Golden Dict[368]	✓	✓	✓	✓	✓
379	Artha[369]	✓	✓	✓	✓	✓
380	Resistor Color Calculator[370]	✓	✓	✓	✓	✓
381	StarDict[368]	✓	✓	✓	✓	✓

NOTE The Authors have relaxed the selection criteria and have included 207 tools out of 381 in SpecX. The remaining tools either does not lie on the basic selection criteria or have following notable issues:

- Software is free but its dependencies are paid
- Obsolete or not available
- Credentials or Subscription needed to avail the software

SpecX Packaged Tools

List of software tools and plugins included in SpecX package are shown in the following table. Software which are recommended are also mentioned in the table. Download size, version and Latest update of each software is mentioned for user convenience.

Sr. no	Software Tool Name	Version	Ubuntu Size (MB)	openSUSE Size (MB)	Fedora Size (MB)	Latest Update
Mathematical and Numerical Analysis (MN)						
Mathematical Analysis						
1	GNU Octave [1]	5.2.0	13.0	28.4	122	2020
2	SageMath [7]	9.0.0	1900	1024	1126	2020
3	Scilab [10]	6.0.2	88.9	116	253	2019
4	gretl [12]	1.9.90	10.1	6.2	19.0	2019
5	GeoGebra [13]	5.0.51	5.7	58.6	80.4	2020
6	PSPP [14]	1.2.0	4.7	4.9	4.3	2018
7	SMathStudio [16]	0.99.7	1.0	1.0	1.0	2018
8	Tilp [17]	1.19.1	0.5	0.5	0.7	2016
9	Shogun [19]	3.2.0	250	250	133	2017
Finite Element Analysis						
10	Agros2D [21]	3.2.0	0.06	0.066	591	2017
11	Calculix [23]	0.23.0	130.6	130.6	130.6	2019
12	CodeAster [24]	1.13.1	3.7	286	286	2019
13	deal.II [26]	8.5.1	116	39.5	39.5	2019
14	DUNE [27]	2.7.0	0.54	0.54	0.54	2020
15	Elmer [28]	8.4.0	76.6	76.6	76.6	2019
16	F Enics Project[29]	1.1.0	1.1	1.1	1.1	2019
17	FreeFem++ [32]	4.5.0	210	210	210	2020
18	GiD [33]	14.0.3	166	166	166	2019
19	Get FEM++ [34]	4.2.1	4.8	4.8	4.8	2018
20	Julia FEM [36]	1.0.5	85.0	66.3	44.0	2020
21	MFEM [37]	4.0.0	5.1	4.4	4.4	2018
22	MoFEM JosePH [38]	0.9.1	20.0	20.0	20.0	2020
23	OO嫵EM [39]	2.5.0	3.8	3.8	3.8	2016
24	Open FOAM [40]	7.0.0	258	258	37	2020
25	Range Software [42]	3.2.3	8.3	25.6	9.6	2019
26	FreeCAD [46]	0.18.0	67.9	249	251	2019
Programming (PROG)						
Code Editors						
27	Sublime Text [174]	3.2.2	9.8	13.5	13.0	2019
28	Atom [176]	1.44.0	106	162	162	2020
29	Visual Studio Code[178]	1.42.1	55	79.0	85	2020
30	Vim [179]	8.0.0	8.39	3.1	8.0	2019
31	jEdit [180]	5.5.0	4.4	2.0	2.5	2018
32	BlueFish [183]	2.2.0	0.2	3.9	4.3	2020
33	Brackets[184]	1.13.0	58.5	64.7	4.3	2019
34	Geany [187]	1.34.1	3.2	2.0	3.7	2019
35	JED [189]	0.99.0	0.6	1.1	1.6	2019
36	GNU nano [190]	2.5.3	0.2	0.2	0.6	2020
37	GNU Emacs [191]	46.1.0	1.0	27.3	43.0	2019
Compilers						
38	GCC GNAT (ADA) [192]	-	4.7	4.7	21	2016
39	NASM (Intel *86) [193]	2.11.08	1.5	0.3	0.4	2018
40	FreeBASIC (BASIC) [194]	1.07.1	6.0	6.0	6.0	2018

41	GNU Compilers (C/C++) [195]	7.3.5	4.7	4.7	6.0	2019
42	Mono (C#) [196]	6.8.0	83.7	34.4	30.0	2020
43	GnuCOBOL (COBOL) [197]	2.2.0	1.0	1.0	2.0	2018
44	javac (JAVA) [198]	11.0	0.99	0.99	32.0	2019
45	ActivePerl interpreter (Perl) [199]	5.28.1	48.8	48.8	2.0	2017
46	python3 (Python) [200]	3.5.1	8.0	8.0	8.0	2020
47	ActiveTcl (Tcl/Tk) [201]	8.6.9	24	24	24	2019
48	ruby (Ruby) [202]	1.2.3	5.8	5.8	4.1	2019
49	r-base [203]	3.6.2	24.6	24.6	241	2019
C/C++ Development						
50	Code::Blocks [65]	17.12.1	13.1	17.2	21	2017
51	NetBeans C/C++ pack [66]	11.2.0	184.8	184.8	184.8	2019
52	Qt Creator [67]	5.14.1	1228	1228	1228	2020
53	CodeLite [69]	13.08.0	47.3	28.2	32.8	2019
54	Eclipse IDE (C/C++) [71]	4.14.0	249.8	259.8	249.8	2019
55	Kdevelop (C/C++) [66]	4.4.7	90.9	50.0	52.0	2020
56	Ultimate++ the IDE [76]	10.3.4	49.2	249.8	116	2019
57	Anjuta [78]	3.18.2	6.1	95.7	95.7	2018
C# and Visual Basic Development						
58	MonoDevelop [80]	5.10.0	159	84.9	15.0	2020
JAVA Development						
59	BlueJ [85]	4.2.2	16.0	13.9	10	2019
60	NetBeans JAVA pack [86]	11.2.0	184.8	184.8	184.8	2019
61	Dr Java [87]	1.0.0	19.3	19.3	19.3	2016
62	Eclipse IDE (JAVA) [88]	4.14.0	197	197	197	2019
63	Greenfoot [89]	3.6.1	197	197	197	2019
64	IntelliJ IDEA Community [90]	19.3.3	643	643	643	2019
65	jGRASP [94]	2.0.6	210	210	210	2020
Python Development						
66	IDLE [98]	3.5.1	0.1	0.1	8.6	2020
67	PyCharm [99]	19.3.3	373	373	373	2019
68	Anaconda [106]	19.10.0	506	506	506	2019
69	Eric [101]	20.2.0	146.4	146.4	146.48	2018
70	Kdevelop (Python) [66]	4.4.7	90.9	50.0	52.0	2020
71	NINJA-IDE [104]	2.3.0	12.0	12.0	16.0	2018
72	Pyzo [107]	4.0.1	5.5	5.5	5.5	2020
73	Thonny [109]	3.2.7	1.1	1.1	1.1	2020
Ruby Development						
74	Aptana Studio 3 [111]	3.6.1	123	123	123	2018
75	NetBeans (Ruby) [114]	11.2.0	184.8	184.8	184.8	2019
Tcl/Tk Development						
76	VTCL [117]	8.6.0	6.6	6.6	6.6	2013
Perl Development						
77	NetBeans (Perl) [86]	11.2.0	184.8	184.8	184.8	2019
HTML/CSS/Javascript Development						
78	Brackets [22]	1.13.0	5.0	64.7	64.7	2018
79	Aptana Studio 3 [111]	3.6.1	123	123	123	2018
80	Eclipse WTP [124]	19.12.0	195	195	195	2019
81	Sea Monkey [126]	2.0.0	56.7	41.3	55.0	2020
82	Amaya [127]	11.4.4	18.5	18.5	36.9	2013
83	KompoZer [128]	0.8.0	7.5	12.3	40	2016
84	BlueGriffon [129]	3.1.0	210	270	270	2019
85	NetBeans packs [86]	11.2.0	184.8	184.8	184.8	2019
PHP Development						
86	Eclipse PDT [131]	19.12.0	218	218	218	2019
DBMS Development						
87	MySQL Workbench [137]	0.8.15	34.7	24.8	34.0	2020
88	phpMyAdmin [138]	4.5.4	26.0	12.8	23	2020
89	Adminer [139]	4.2.1	0.3	0.4	1.2	2019
90	DBeaver [143]	6.3.5	56.2	56.2	56.2	2020
91	Maria DB [144]	10.0.38	15.4	19.0	1.9	2020
92	SQLite [145]	3.28.0	0.2	0.2	0.2	2020

SpecX v3.2

93	Percona Toolkit	2.2.0	0.7	0.7	8.2	2019
94	DBVizualizer [151]	10.0.26	50.2	50.2	50.2	2020
CLISP Development						
95	Portacle [159]	1.4.0	81.8	81.8	81.8	2020
96	Lispbox [161]	0.7.0	81.0	81.0	81.0	2012
97	GNU Emacs (CLISP) [163]	2.49.0	8.4	8.4	9.9	2019
98	SBCL [167]	1.4.1	9.9	9.9	16.0	2020
99	GNU Zile [168]	2.4.13	0.27	0.27	0.1	2016
100	Xemacs [169]	21.5.34	4.4	28.9	18.0	2013
101	Emacspeak [170]	41.0.0	25.8	25.8	57.0	2019
R Development						
102	RStudio [172]	1.2.5		105	272	2019
103	RKWard [173]	0.7.0	89.0	76.8	309	2020
Circuit Analysis and PCB Design (CPCB)						
Schematic and PCB Design						
104	FidoCadJ [206]	0.24.7	0.6	0.6	0.6	2017
105	gerbv [208]	2.7.0	1.6	0.2	2	2019
106	kicad StepUp [209]	5.1.5	273	425	121	2018
Protoboard Viewer						
107	Fritzing [211]	0.9.2	16.5	7.2	19	2019
Schematic and Circuit Simulator						
108	SimulIDE [213]	0.3.12	3.0	3.0	3.0	2019
109	gEDA [214]	1.10.0	6.7	10.0	10.2	2013
Integrated Synthesis Environment (ISE)						
110	Icarus Verilog [219]	10.2.0	1.9	1.8	2.1	2019
111	HADES [220]	1.0.0	4.9	4.7	4.7	2015
Very-large-scale integration (VLSI)						
112	Electric [221]	9.07.0	28.3	20.3	20.3	2016
113	Magic VLSI [222]	8.0.2	1.3	1.3	3.1	2017
Simulation Program with Integrated Circuit Emphasis (SPICE)						
114	Oregano [225]	0.70.3	3.3	3.3	2.0	2018
115	ngspice [226]	26.1	2.0	2.0	5.6	2019
116	gspiceui [228]	1.1.0	2.5	2.5	13	2018
117	GNU-Cap [229]	1.036	0.9	0.9	1.1	2017
118	Gwave [230]	9.2.13	0.4	0.4	0.4	2015
119	GTKWave [231]	3.3.10	2.4	2.2	4.2	2020
120	QSpiceNG [233]	2.1.1	1.8	42.6	1.7	2015
121	NetlistViewer [234]	0.2	1.1	1.1	1.1	2017
Printable Schematic Design						
122	CircuiTikZ [350]	-	0.8	0.8	70	2020
123	XCircuit [351]	3.8.63	0.8	0.5	2.2	2018
Power Systems (PS)						
124	GridLAB-D [240]	4.0.0	45.4	45.4	45.4	2019
125	PyPSA [241]	0.16.1	0.1	0.1	0.1	2020
126	Pentode [244]	1.11.0	0.2	0.2	0.2	2018
127	RAPSim [245]	0.95.0	6.9	6.9	6.9	2016
128	Python Power Electronics [246]	4.2.3	0.1	0.1	0.1	2020
Embedded Systems (EMBD)						
PIC Development Tools						
129	MPLAB [248]	5.35.0	932.4	695	695	2020
130	SDCC [249]	4.0.0	16.6	2.9	2.9	2020
131	PICSimLab [251]	0.7.5	146.9	70.8	70.8	2018
132	gputils [252]	1.5.0	369.71	1.6	1.2	2019
ARM Development Tools						
133	Code Composer Studio [256]	9.3.0	1136	1136	1136	2019
134	Eclipse IDE for MCU [257]	4.7.2	247	247	247	2017
Arduino Development Tools						
135	Arduino IDE [260]	1.8.10	125	125	125	2020
136	Processing IDE [261]	3.5.4	132	132	132	2020
AVR Development Tools						
137	AVR toolchain [262]	5.4.0	18.9	18.1	18.1	2018
138	simuavr [263]	1.2.0	1.7	15.1	15.1	2016

805I Development Tools						
139	MCU 805I IDE [266]	1.4.10	3.6	3.99	3.6	2014
140	GNU 8085 Simulator [267]	1.4.1	0.01	0.3	0.8	2016
141	SDCC[249]	4.0.0	16.6	2.9	4.3	2020
Texas Instruments Development Tools						
142	Energia [268]	1.8.10	147	147	147	2015
RISC-V Development Tools						
143	RISCV-VP[269]	1.0.1	27.6	27.6	27.6	2019
144	jupiter[273]	3.1.0	40	40	40	2013
145	renode [274]	1.8.2	6.0	6.0	6.0	2020
146	rars [275]	1.4.0	1.73	1.73	1.73	2013
147	Eclipse IDE for RISCV [278]	4.7.2	247	247	247	2017
MIPS Development Tools						
148	MARS [279]	4.5.0	4.2	4.2	4.2	2020
149	spim [280]	9.1.21	38.0	38.0	0.6	2020
Networking (NET)						
Network Design Software						
150	Edraw[282]	9.4.0	282	315	315	2019
Network Simulation Software						
151	Packet Tracer [283]	7.3.0	165	297	297	2019
152	Gns3 [284]	2.2.5	36.7	36.7	36.7	2019
153	Wireshark [285]	3.2.2	21.5	22.0	27.0	2019
154	tcpdump[287]	4.9.3	354	2.6	1.2	2019
Network Monitoring Software						
155	Icinga 2 [291]	2.7.2	11.5	6.0	3.8	2019
156	Zabbix[295]	4.4.4	0.04	0.5	0.3	2020
Communication Systems (COMM)						
Electromagnetic (EM) Simulation						
157	gprMax[299]	3.1.5	33	52.13	52.13	2020
Antenna Design and Simulation						
158	Meep[307]	1.9.0	4.7	11.5	11.5	2020
159	openEMS [308]	0.0.35	40.6	1.2	16.2	2020
160	MaxFEM[309]	0.3.5	110	110	110	2018
Technical Writing and Presentation (TWP)						
Document Preparation Systems						
161	TeX Live [311]	1.0.0	734	994	184	2019
162	TeXstudio [312]	2.12.10	384	1008.7	199	2020
163	TeXmaker [313]	5.0.3	845	1003.8	196	2018
164	Gummi [314]	0.6.6	293	293	71	2020
165	Lyx [315]	2.1.4	809	809	213	2020
166	GNU TeXmacs [316]	1.99.12	42.9	1064.96	224	2019
167	Halibut[317]	1.2.15	1.0	0.7	0.6	2020
Word Processor						
168	LibreOffice Writer [320]	6.3.3	7.29	211.4	11	2019
169	WPS Office Writer [321]	11.1.0	195	195	194	2019
170	AbiWord [322]	3.0.2	8.1	8.1	12	2019
171	CalligraWords [324]	3.1.0	157	34.7	21.0	2018
Spreadsheet Editor						
172	LibreOffice calc [326]	6.3.3	6.2	211.4	11	2020
173	WPS Office Spreadsheets[327]	11.1.0	195	195	194	2019
174	Gnumeric[328]	1.12.28	18.8	18.8	16	2019
175	Pyspread[329]	2.0	1.76	1.76	1.76	2020
176	CalligraSheets [324]	3.1.0	157	34.7	24	2018
Presentation Program						
177	LibreOffice Impress [331]	6.3.3	0.9	211.4	11	2020
178	WPS Office Presentations [321]	11.1.0	195	195	194	2019
179	CalligraStage [324]	3.1.0	157	34.7	29	2018
Diagram/Flowchart						
180	LibreOffice Draw [335]	6.3.3	2.3	211.4	11	2020
181	Dia [336]	0.97.3	4.6	5.1	4.1	2019
182	yEd [337]	3.19.1	133.5	123	123	2020
183	Edraw Flowchart Software [338]	9.4.0	282	315	315	2020

Reference and Citation						
184	Zotero [339]	5.0.82	57.4	46.3	57.4	2020
185	JabRef [340]	4.3.1	54.2	132.1	291	2018
186	KBibTeX [341]	0.4.4	167	4.6	59.0	2020
187	Referencer [343]	1.2.2	0.6	0.6	0.6	2018
Project Management						
188	Git [344]	2.16.4	2.93	2.93	0.3	2020
189	GitKraken[345]	6.5.3	70.9	101	101	2020
190	TaskJuggler[346]	3.6.0	0.8	0.01	0.01	2020
191	Gantt Project [347]	2.8.10	17.2	16.8	0.8	2019
Utilities and Plugins						
Virtual Machines (VMs)						
192	VirtualBOX [352]	6.0.8	24.4	37.5	100	2020
193	QEMU[355]	4.2.0	59.3	29.0	82	2019
Other Virtualization						
194	ttyOtty [356]	1.2.0	0.02	0.04	0.04	2018
195	socat [357]	1.7.3	0.3	0.2	0.3	2015
Serial Monitor						
196	PuTTY [359]	0.73.0	0.6	0.9	1.1	2019
Calculator						
197	SpeedCrunch [360]	0.12.0	0.4	0.8	1.0	2015
198	Generic Mapping Tools [361]	5.4.5	153	92.9	80	2019
199	Qalculate [362]	3.7.0	1.0	1.9	1.8	2020
200	GNOME Calculator [363]	3.26.0	0.32	1.6	1.1	2020
Unit Converter						
201	Gonvert [364]	0.2.39	0.1	0.1	9.7	2016
202	ConvertAll[365]	0.7.5	0.1	22.3	22.3	2020
203	MultiConvert[366]	1.8.0	3.0	1.9	1.9	2013
Help and Learning Resources						
204	Golden Dict [368]	1.5.0	3.0	3.0	22	2019
205	Artha [369]	1.0.3	0.2	0.2	8.1	2019
206	Resistor Color Calculator [370]	0.1.3	0.01	0.01	9.7	2016
207	StarDict [368]	3.0.1	0.01	0.01	13	2016

Software Installation Process

Installing SpecX software

For downloading of SpecX, visit its website:

<https://github.com/mominaj/SpecX-bin>

1. SpecX can also be downloaded from the following command through git:

```
$ git clone https://github.com/mominaj/SpecX-bin
```

2. Now run the following command on terminal:

```
$ chmod +x SpecX_setup_enUS
$ sudo ./SpecX_setup_enUS
```

3. If the package manager of your linux distribution is busy the installation will terminate. Wait for the background processes to finish or restart the system to reset all the programs running in the background (recommended).

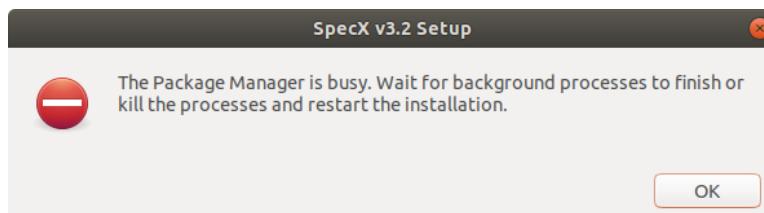


Figure 1: Password Screen

4. Enter your superuser credentials to start SpecX Installation.



Figure 2: Password Screen

5. If the superuser password is incorrect the installation will terminate.

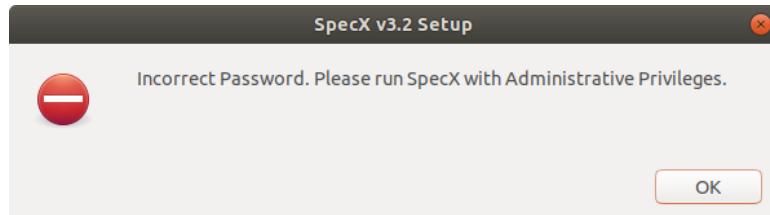


Figure 3: Password Screen

6. Click **OK** to proceed and confirm the internet connection.



Figure 4: Internet Connection Successful Screen

NOTE Installation of SpecX require a proper internet connection to proceed, otherwise the installation terminates.

7. Installation is **terminated** if there is no internet connection.



Figure 5: Internet Connection failed Screen

8. Installation wizard of SpecX will start.



Figure 6: Splash Screen

9. Select you want to install, uninstall or exit SpecX. Uninstallation wizard is identical to installation wizard.

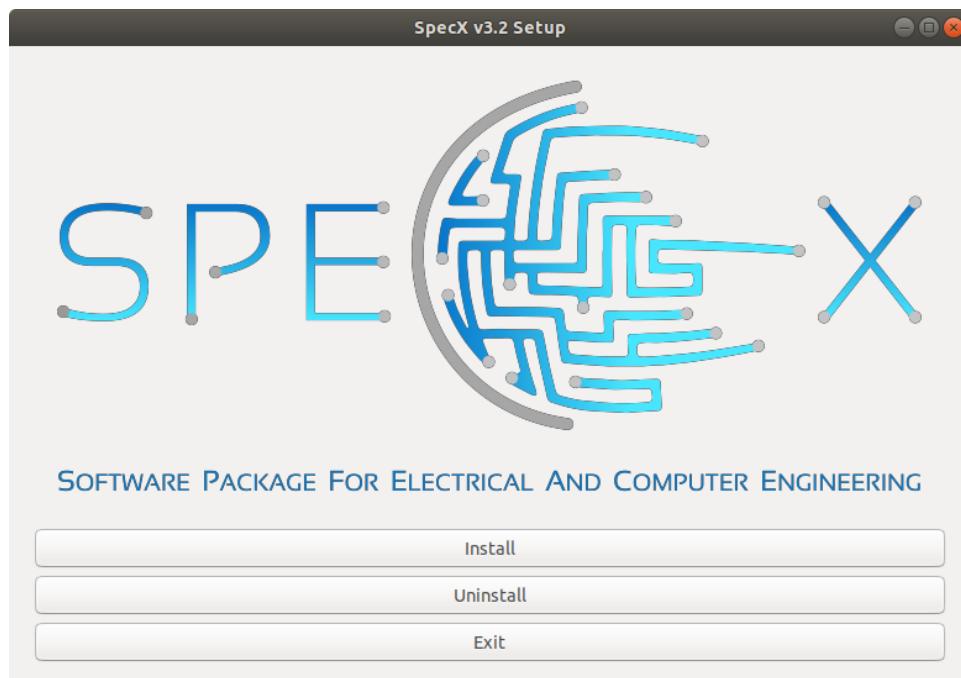


Figure 7: Installer Selection Screen

10. Click **Next** to proceed with the installation.

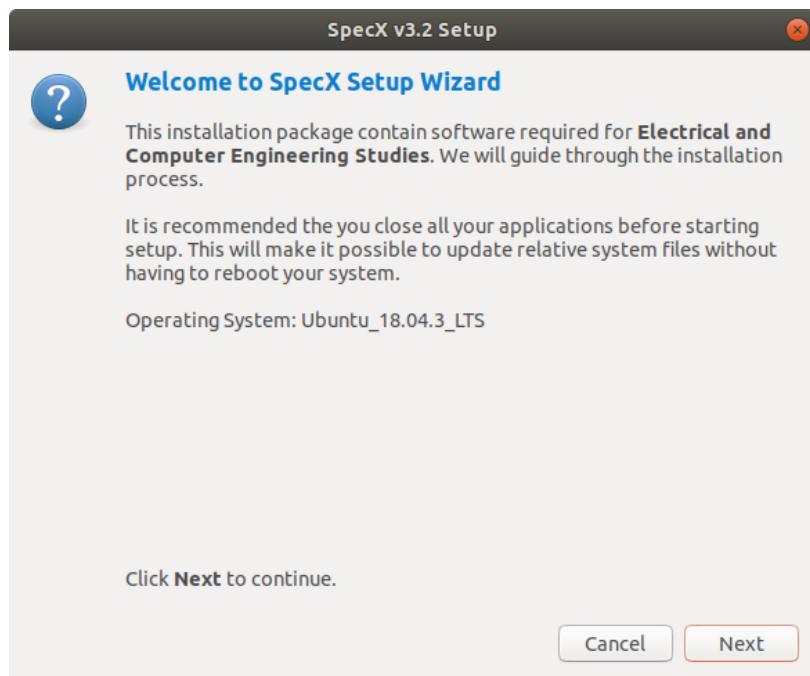


Figure 8: Installation Welcome Screen

11. SpecX pipeline detail screen is displayed. It has the information about which software you want to install. Click Next to Proceed.

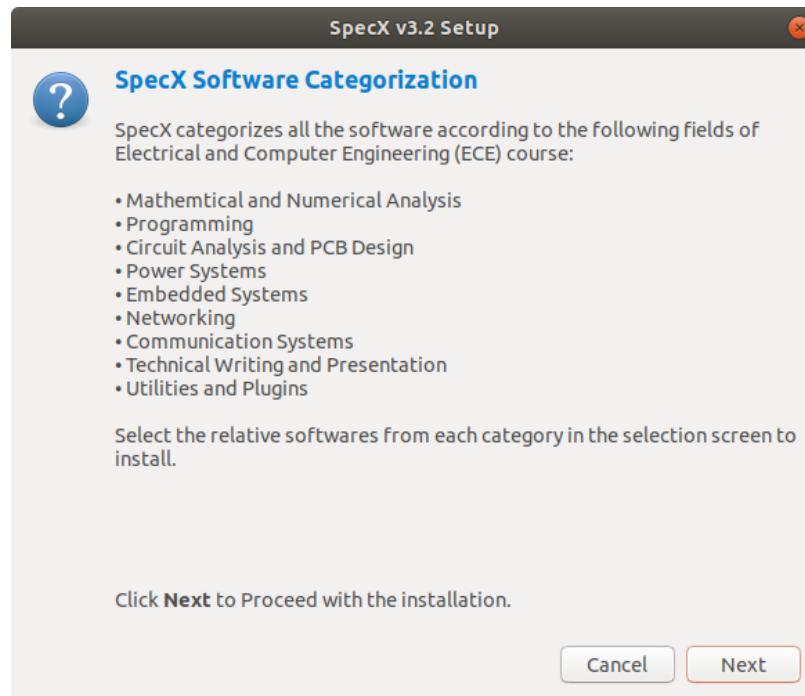


Figure 9: Pipeline information screen

12. Selection screen for Mathematical and Numerical Analysis Tools is displayed. Select the required tools and Click Next.

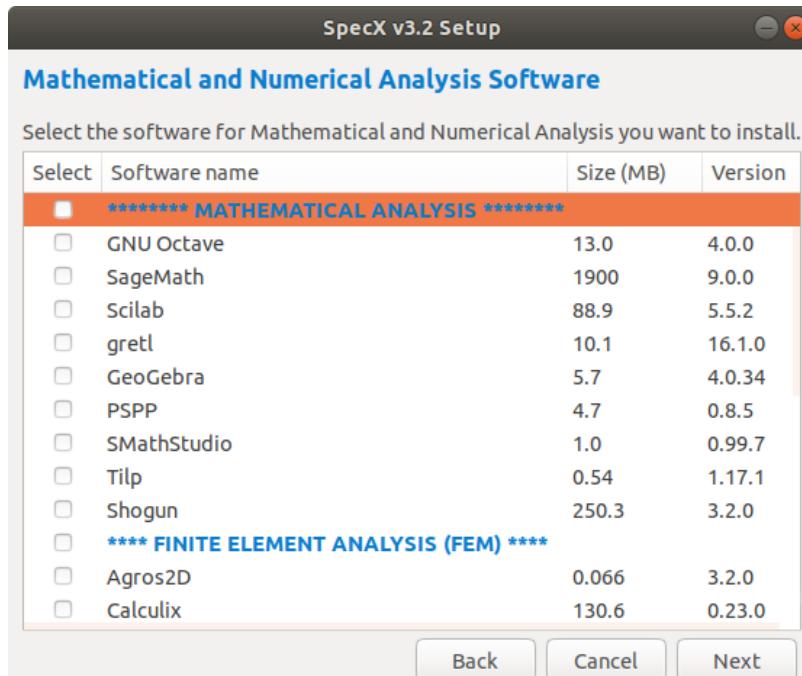


Figure 10: Mathematical and Numerical Analysis tools selection screen

13. Selection screen for Programming Tools is displayed. Select the required tools and Click **Next**.

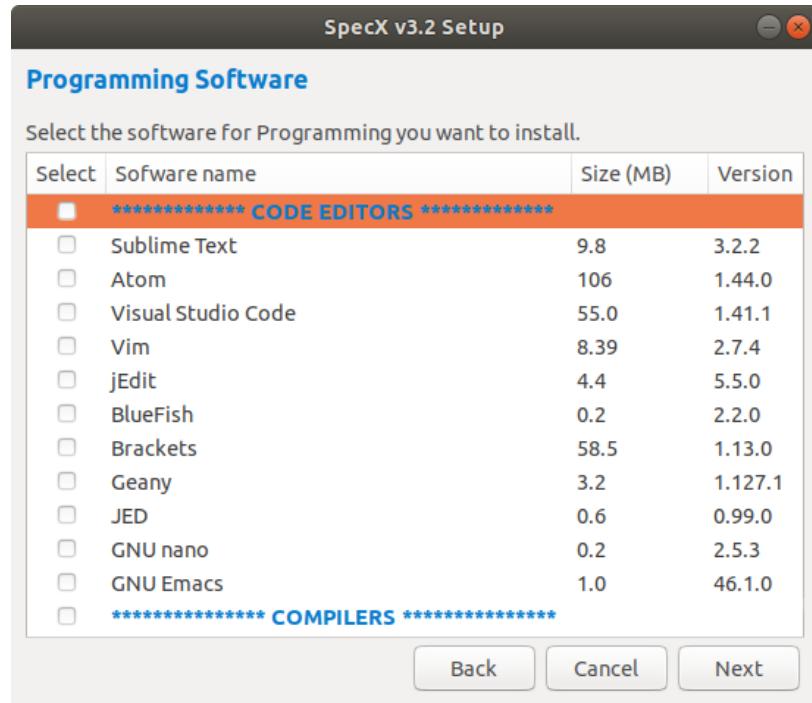


Figure 11: Programming tools selection screen

14. Selection screen for Circuit Analysis and PCB Design tools is displayed. Select the required tools and Click **Next**.

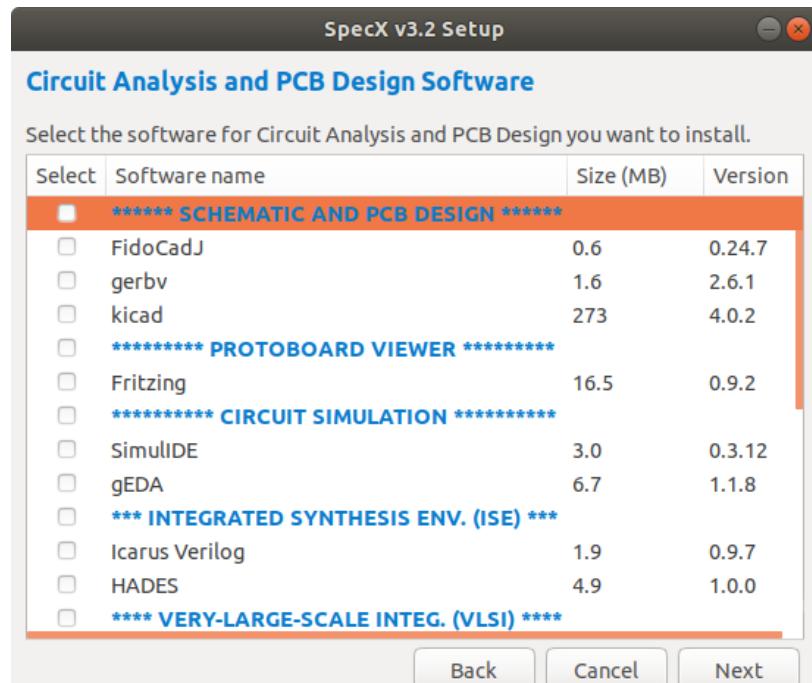


Figure 12: Circuit Analysis and PCB Design tools selection screen

15. Selection screen for Power Systems tools is displayed. Select the required tools and Click **Next**.

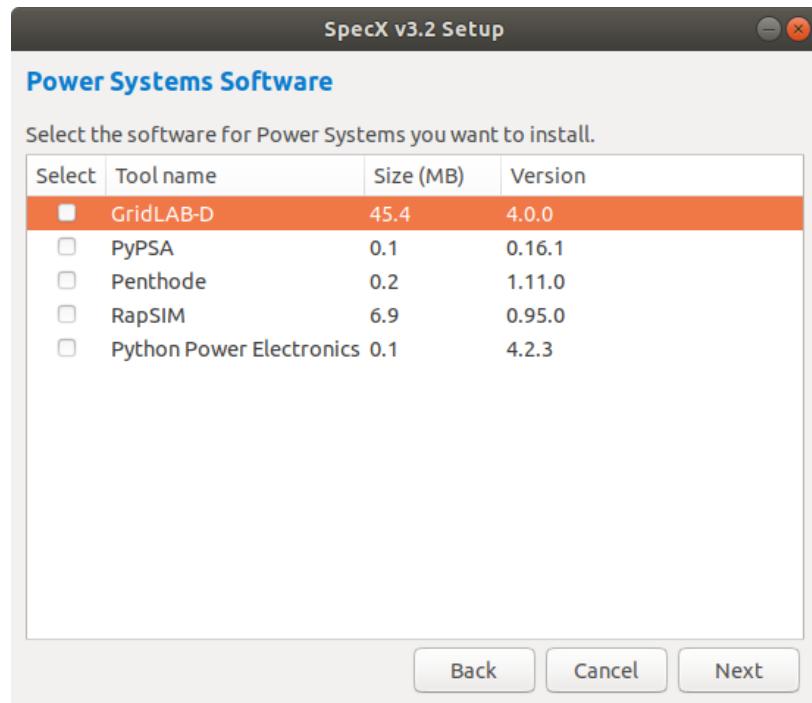


Figure 13: Power Systems tools selection screen

16. Selection screen for Embedded Systems tools is displayed. Select the required tools and Click **Next**.

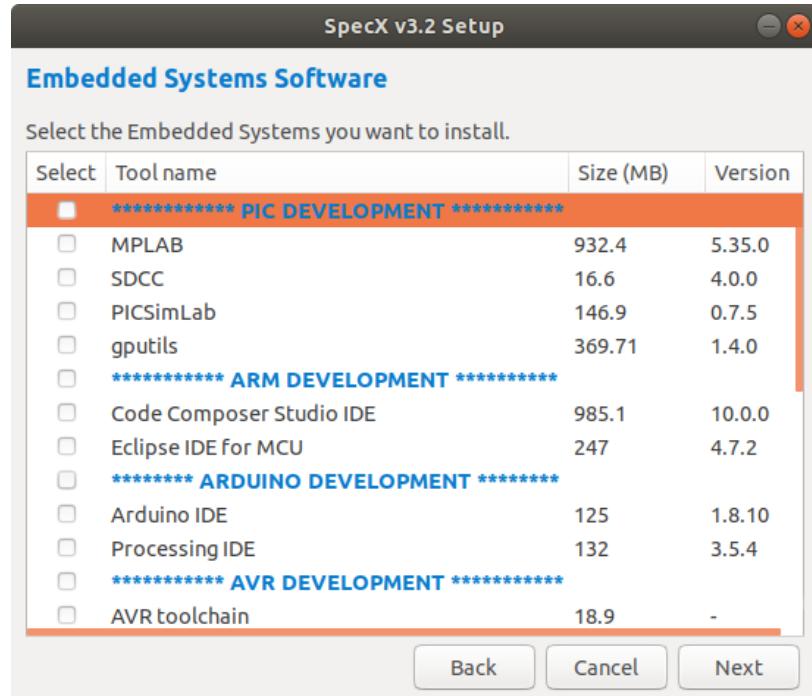


Figure 14: Embedded Systems tools selection screen

17. Selection screen for Networking tools is displayed. Select the required tools and Click **Next**.

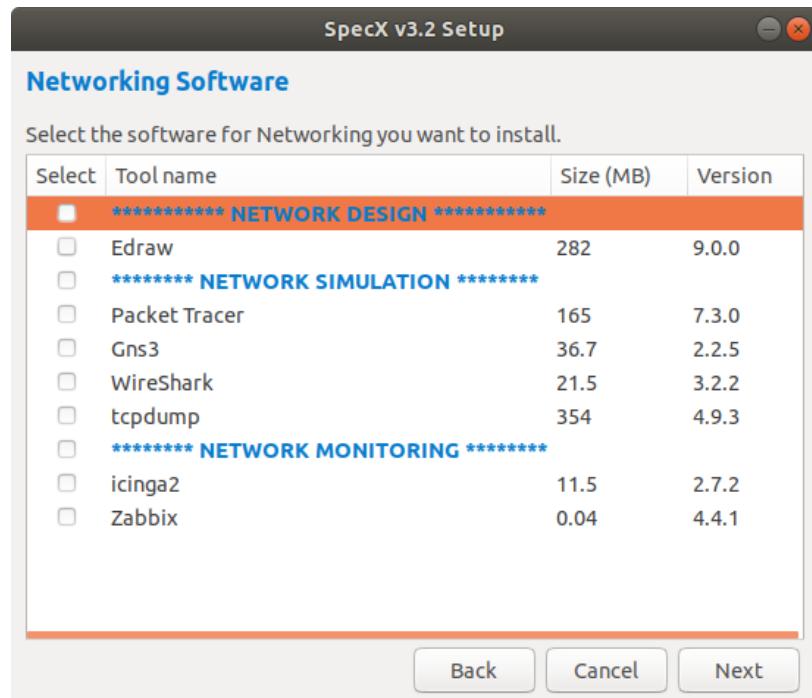


Figure 15: Networking tools selection screen

18. Selection screen for Communication Systems tools is displayed. Select the required tools and Click **Next**.

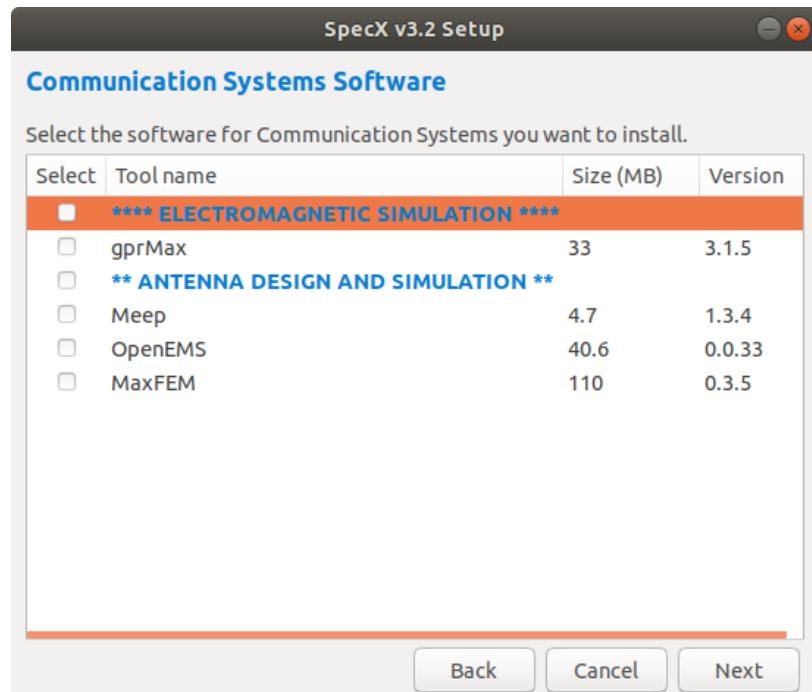


Figure 16: Communication Systems tools selection screen

19. Selection screen for Technical Writing and Presentation tools is displayed. Select the required tools and Click **Next**.

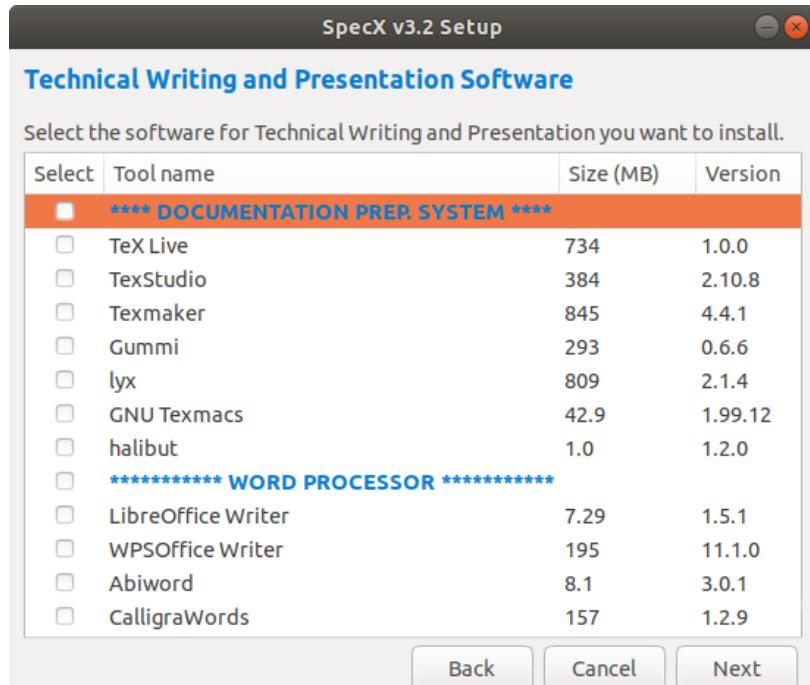


Figure 17: Technical Writing and Presentation tools selection screen

20. Selection screen for Utilities and Plugins tools is displayed. Select the required tools and Click **Next**.

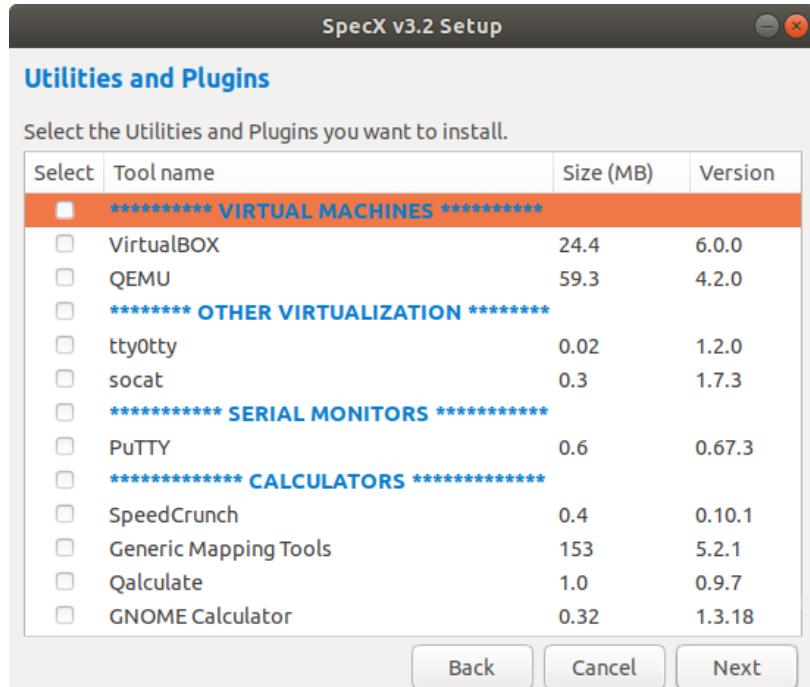


Figure 18: Utilities and Plugins tools selection screen

21. Click **Next** to proceed with the installation.

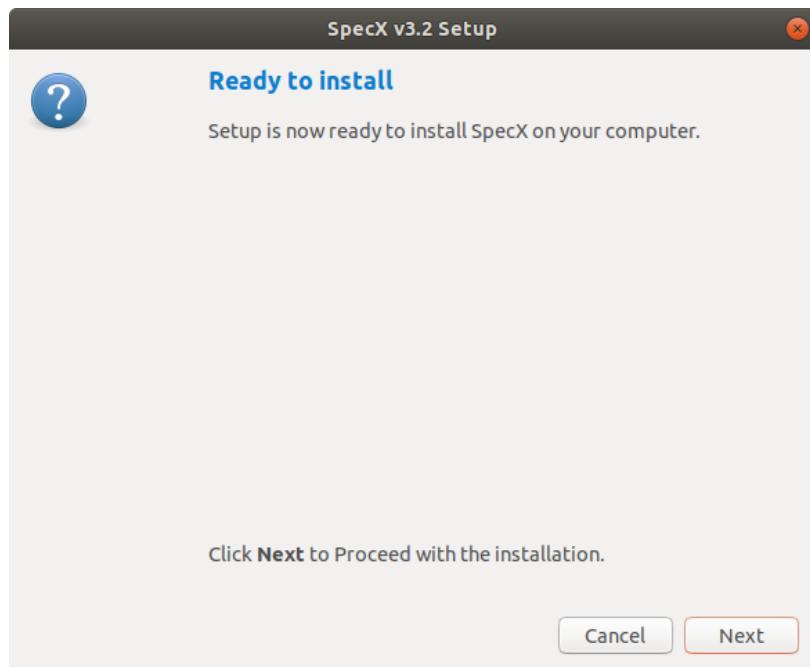


Figure 19: Ready to Install Screen

22. If no software tool is selected the installation will Finish.

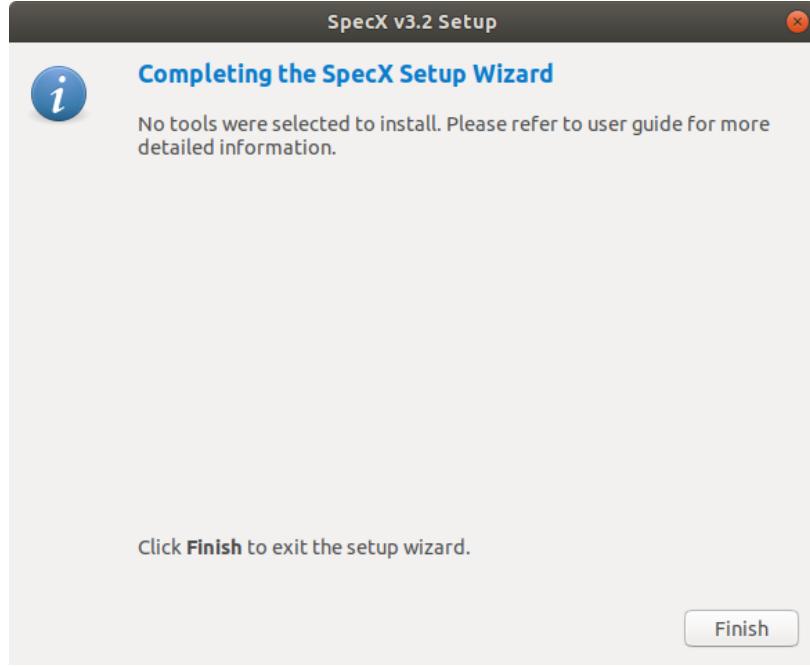


Figure 20: Ready to Install Screen

23. **Dependencies** related to software will start installing.

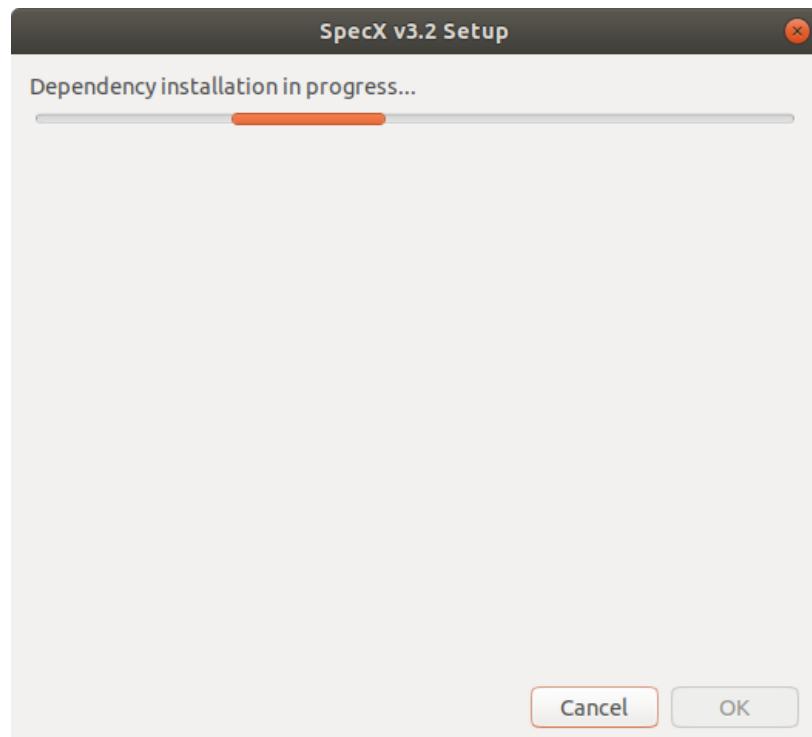


Figure 21: Installation Screen

24. All the dependencies which are installed are displayed at the end of the installation. Click **Ok**.

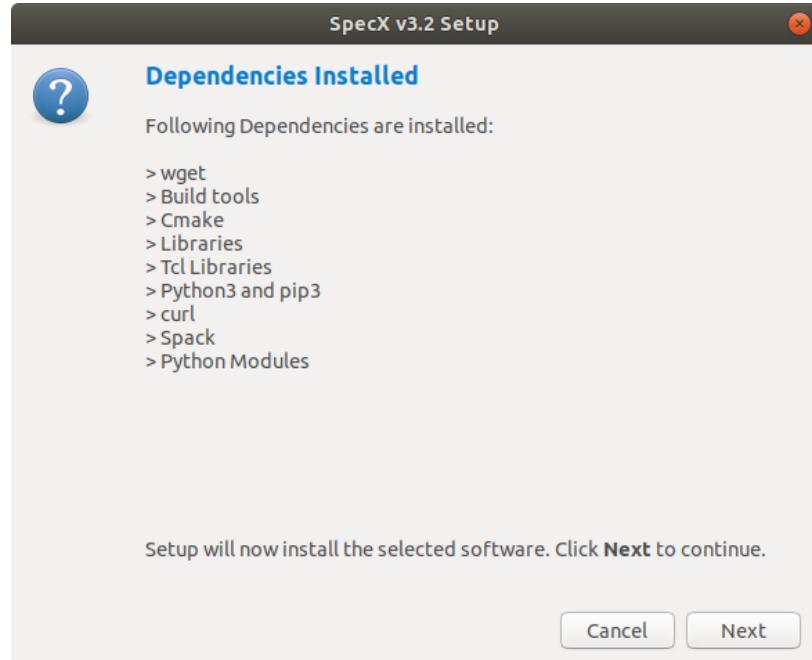


Figure 22: Dependencies installation finished screen

25. Tool installation will continue. Some tools install as standalone installation will be called automatically.

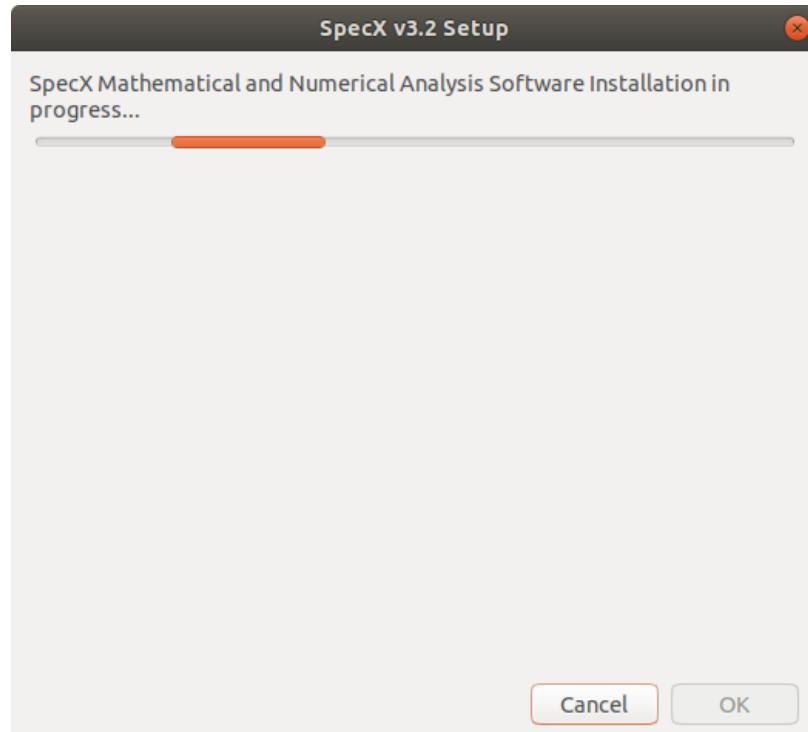


Figure 23: Downloading Screen

26. SpecX will notify you if the software size is more than 200MB and will ask your confirmation.

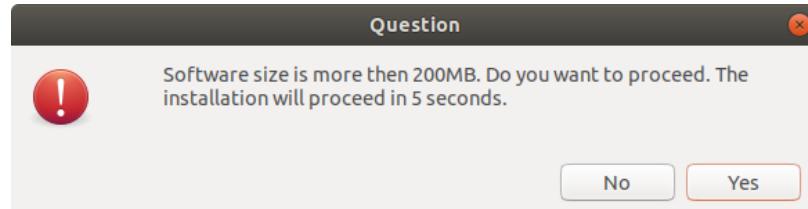


Figure 24: Warning Screen

27. SpecX will notify you if no software is selected from a category.

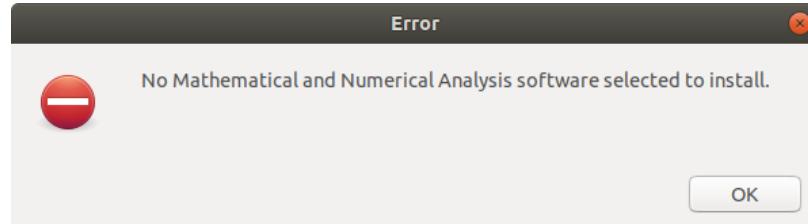


Figure 25: Warning Screen

28. SpecX will notify you of the download progress for many software.

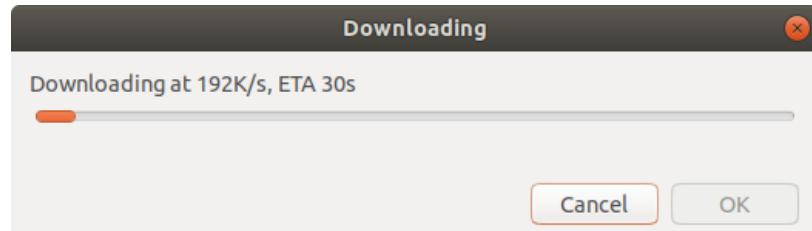


Figure 26: Warning Screen

29. Installation of SpecX is now finished. Click **Finish** to use the tools.

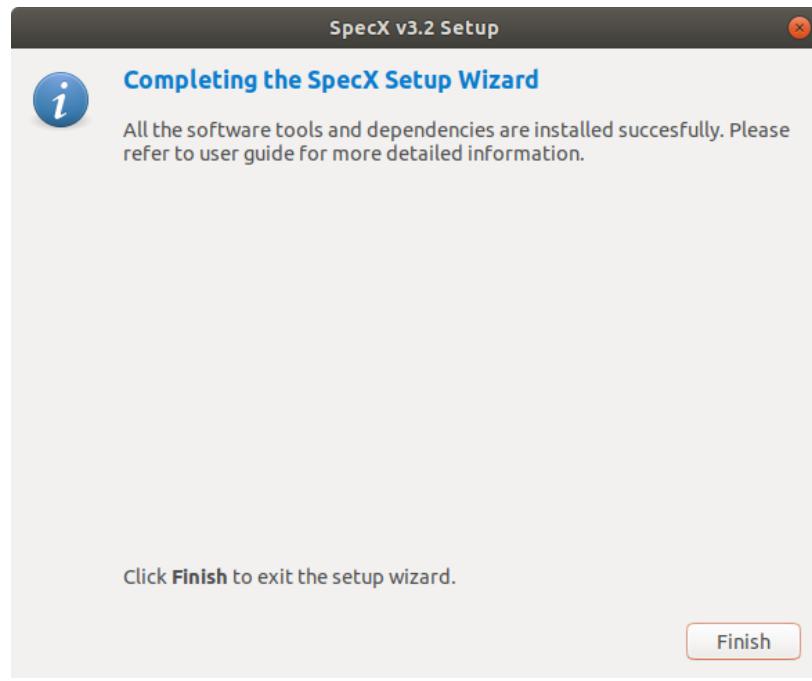


Figure 27: Finishing Installation Screen

Microsoft Windows Support

Installing SpecX software on Microsoft Windows

SpecX is software package for Linux, but Windows users can use SpecX using a Virtual Machine. Follow these steps to initialize a Virtual Machine on your Windows host.

NOTE SpecX support a 64bit Windows host. Microsoft Windows XP and Vista support is discontinued.

1. First you have to **download** the image file of the required OS (For Example Ubuntu) from its website or use the following link:

<http://releases.ubuntu.com/18.04.3/ubuntu-18.04.3-desktop-amd64.iso>

2. **Download** the virtualization software (Oracle VM VirtualBox) from the following link:

<https://download.virtualbox.org/virtualbox/6.1.10/VirtualBox-6.1.10-138449-Win.exe>

3. **Install** this software in Windows OS host.

4. **Start** Virtual Box, and click on the **New** symbol.

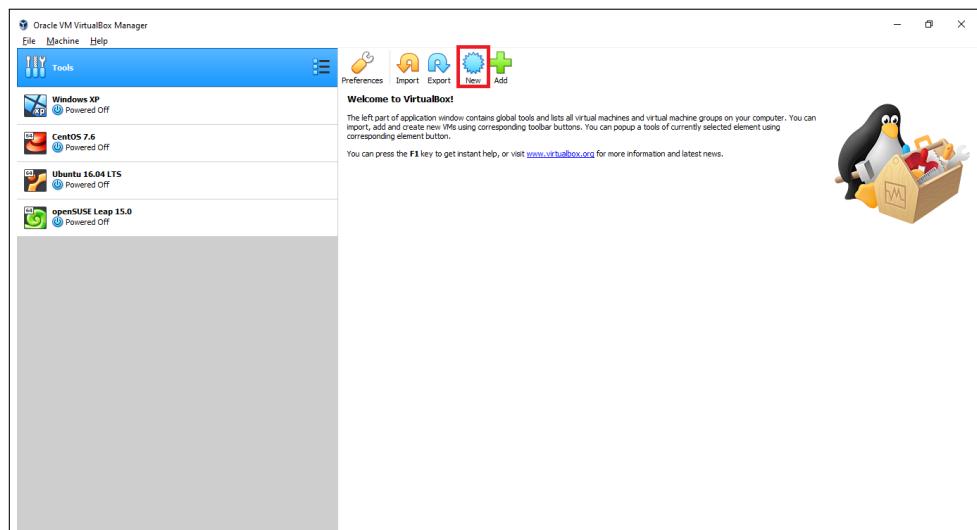


Figure 1: New Virtual OS

5. Give the virtual OS a relevant **Name**. Select the **Type** (Linux) and **Version** (Ubuntu 64-bit) and Click **Next**.

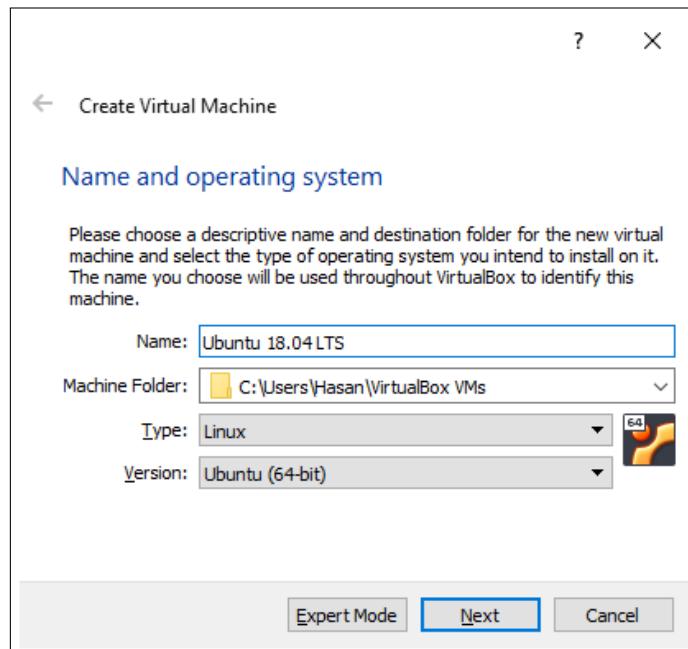


Figure 2: Assigning Name

6. Allocate RAM to the virtual OS. Following system has 8GB of RAM so 2GB of RAM is allocated. You can use more RAM if your system has enough extra RAM.

NOTE *Allocate about half of the RAM to the virtual OS. Click Next.*

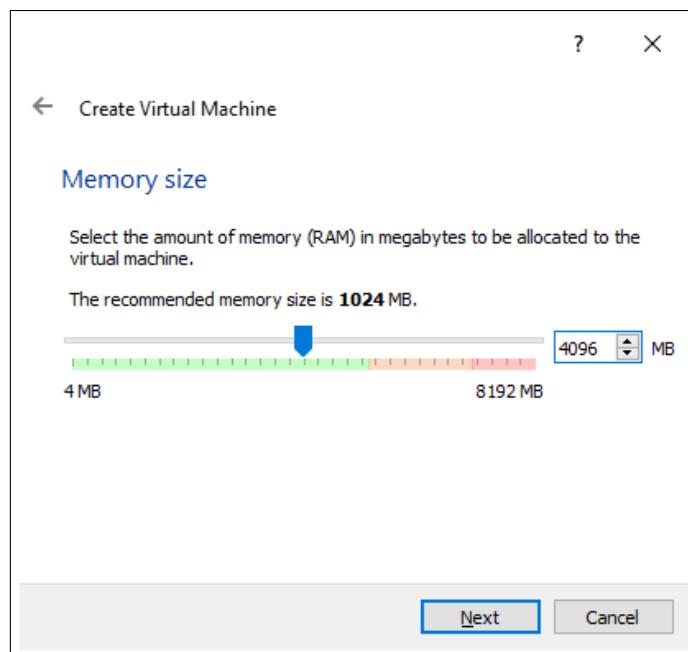


Figure 3: Memory Allocation

7. **Create** a virtual disk. This works as the hard disk of the virtual Linux system. This is where the virtual system will store its files. Click **Create**.

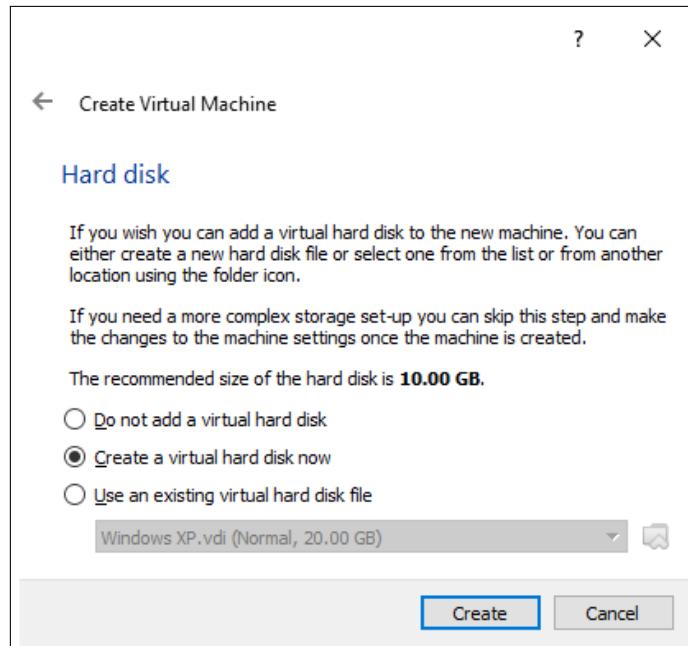


Figure 4: Creating a virtual hard disk

8. Select **VDI** file type here (recommended). Click **Next**.

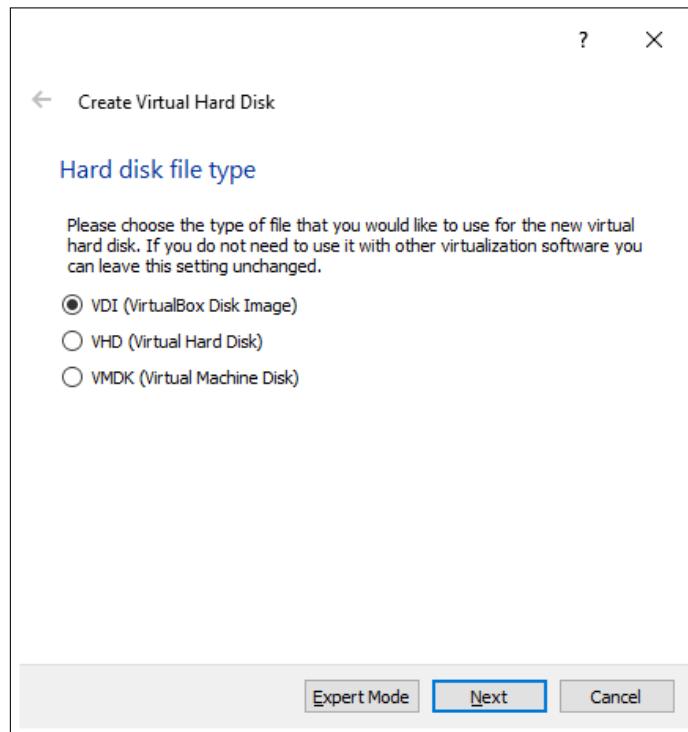


Figure 5: Hard disk file type

9. You can choose either of Dynamically allocated or Fixed size option for creating the virtual hard disk. Choose **Dynamically allocated**. (recommended). Click **Next**.

NOTE *Dynamic allocation is allocated as time passes and data is increased whereas fixed is allocated instantly.*

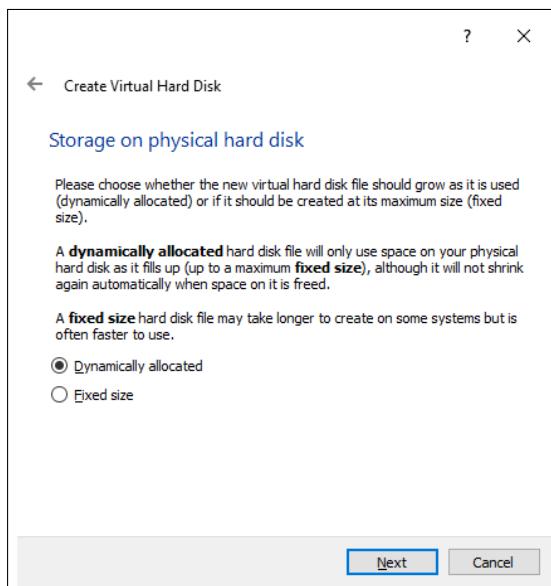


Figure 6: Storage type

10. Select **VDI file type** here (recommended) and Select the **Hard Disk size**. (recommended size: 100 GB). Click **Create**.

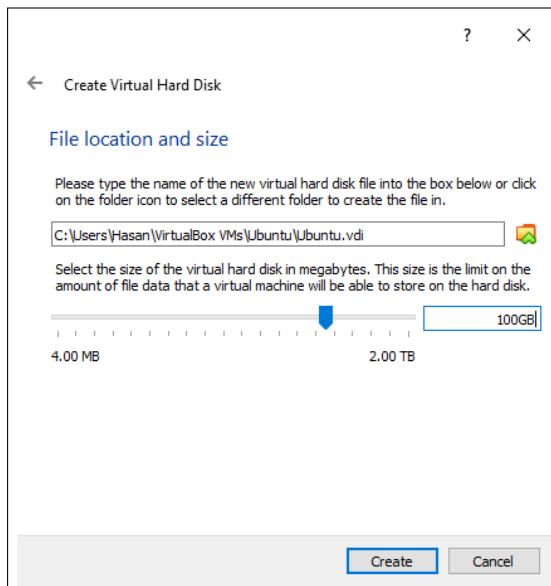


Figure 7: Hard disk size

11. Click **Next**. Now, Select **Settings** to assign the image file of respective OS to VB.

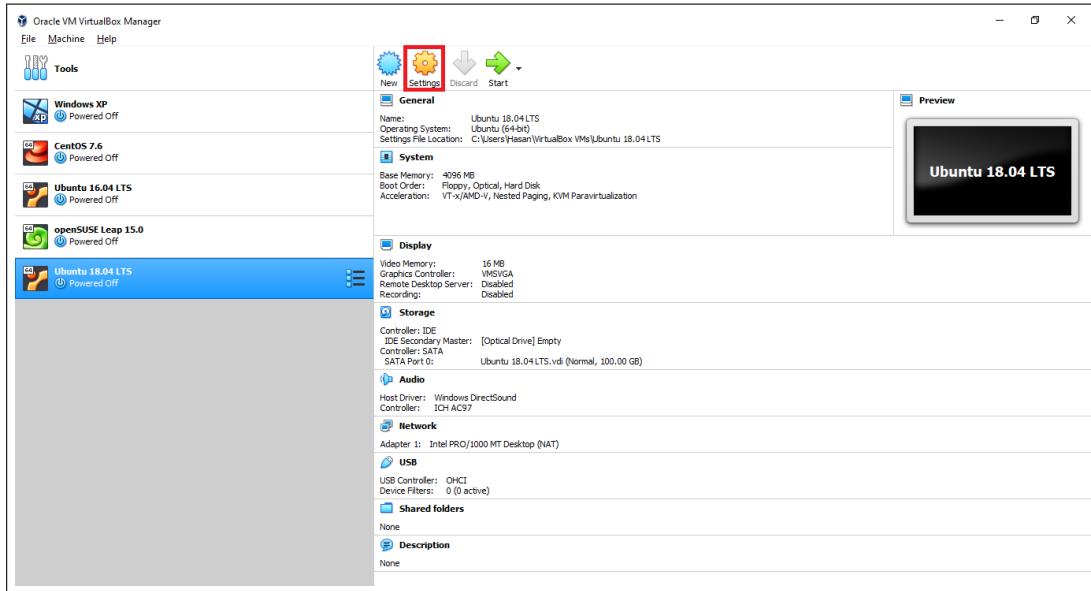


Figure 8: Select Settings

12. Select **General → Advanced**. Now, select the **Shared Clipboard** and **Drag'n'Drop** option to **Bidirectional**.

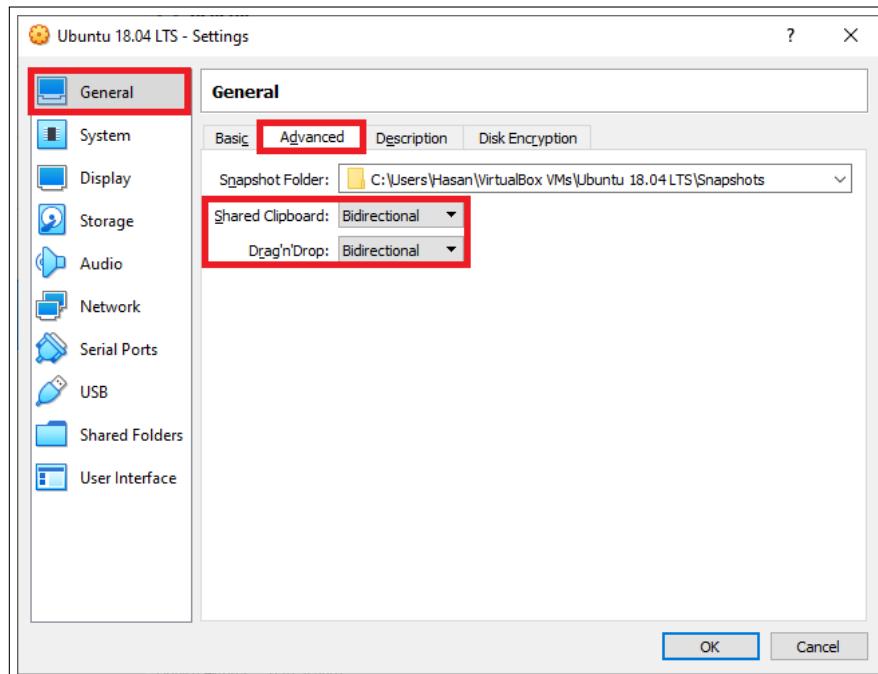


Figure 9: Advanced Settings

13. Select **Settings** to assign the image file of respective OS to VB. Select **Storage → Controller : IDE → Empty**. Now, in the **Attributes** tab, click on **New Disk** and provide the path of downloaded image file of Ubuntu OS. Click **OK**.

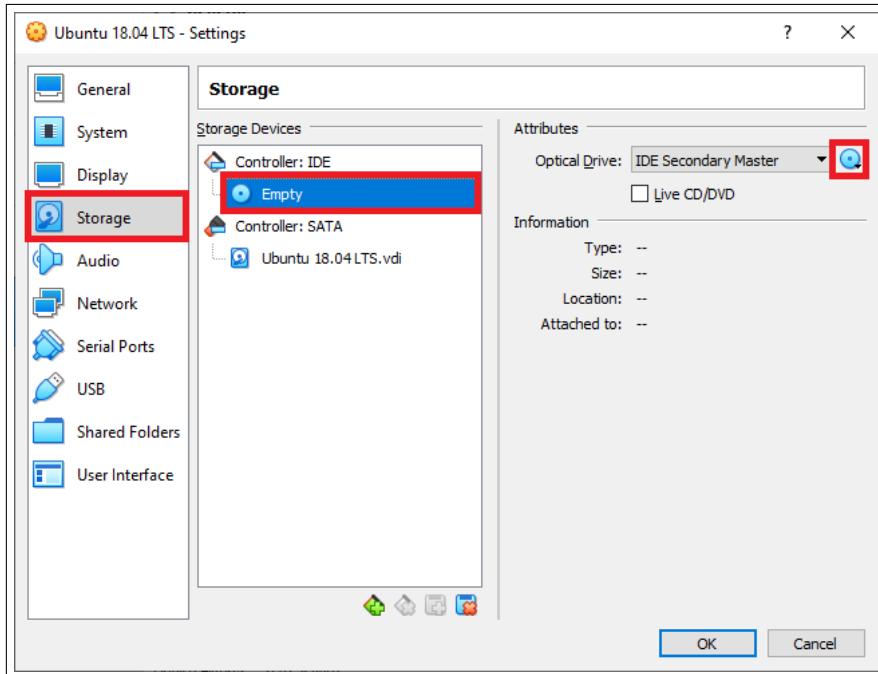


Figure 10: Providing Image file

14. Once everything is in place, it's time to boot that ISO and install Linux as a virtual operating system. Click Start.

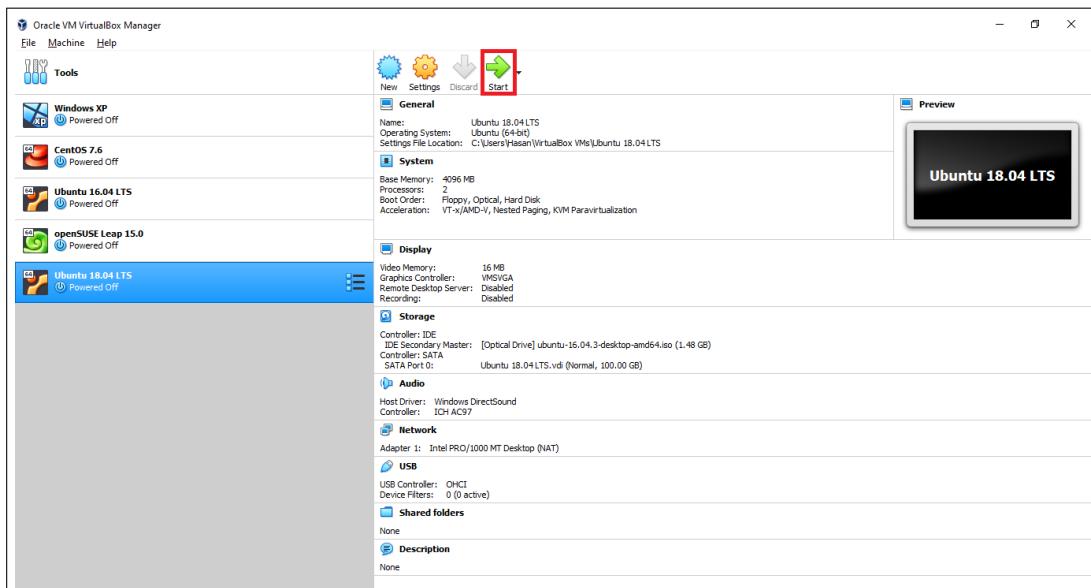


Figure 11: Starting Virtual OS

15. Virtual OS will boot into Linux Installation process. You should be presented with the option to install it. Click **Install Ubuntu**.

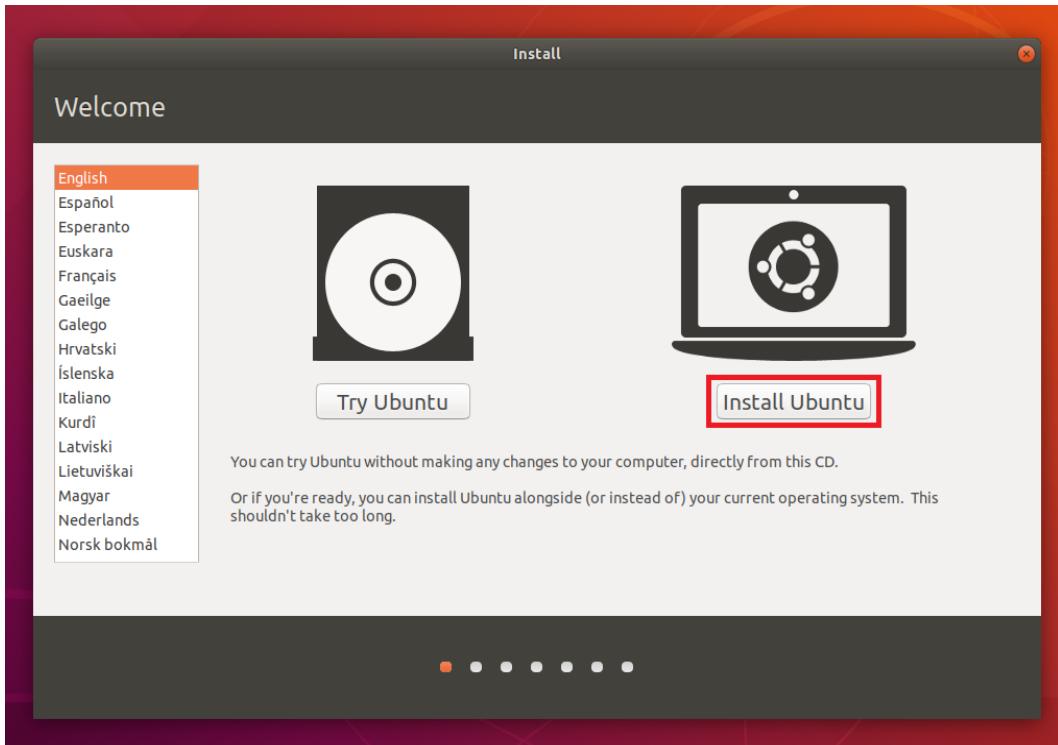


Figure 12: Installing Ubuntu

16. Continue with Normal Installation.

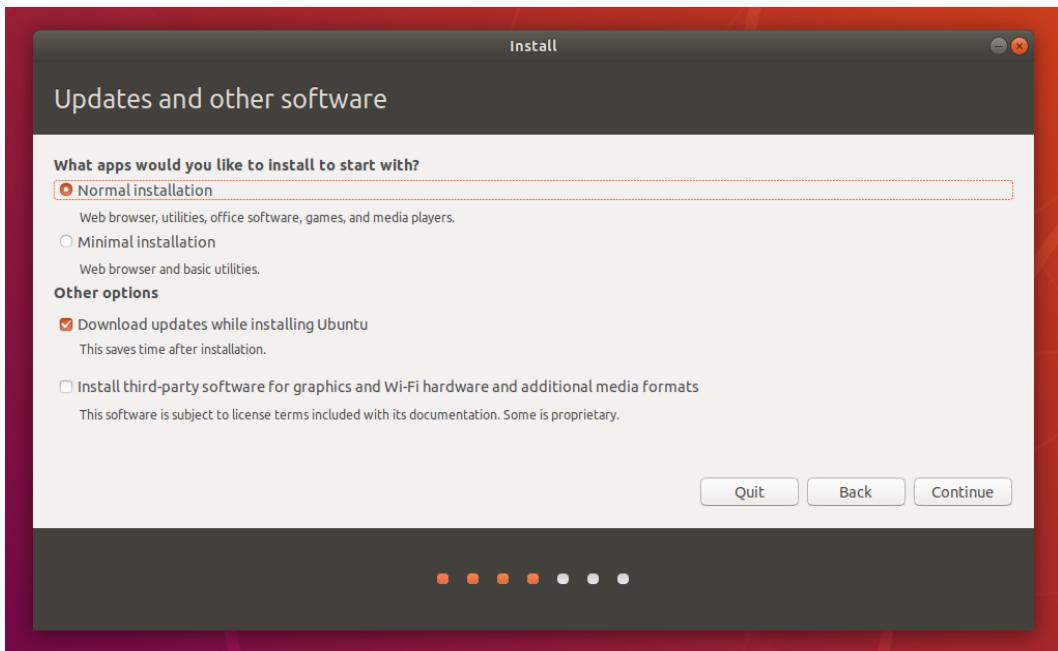


Figure 13: Update Screen

17. In Installation type screen, select **Erase disk** and **Install Now** option.

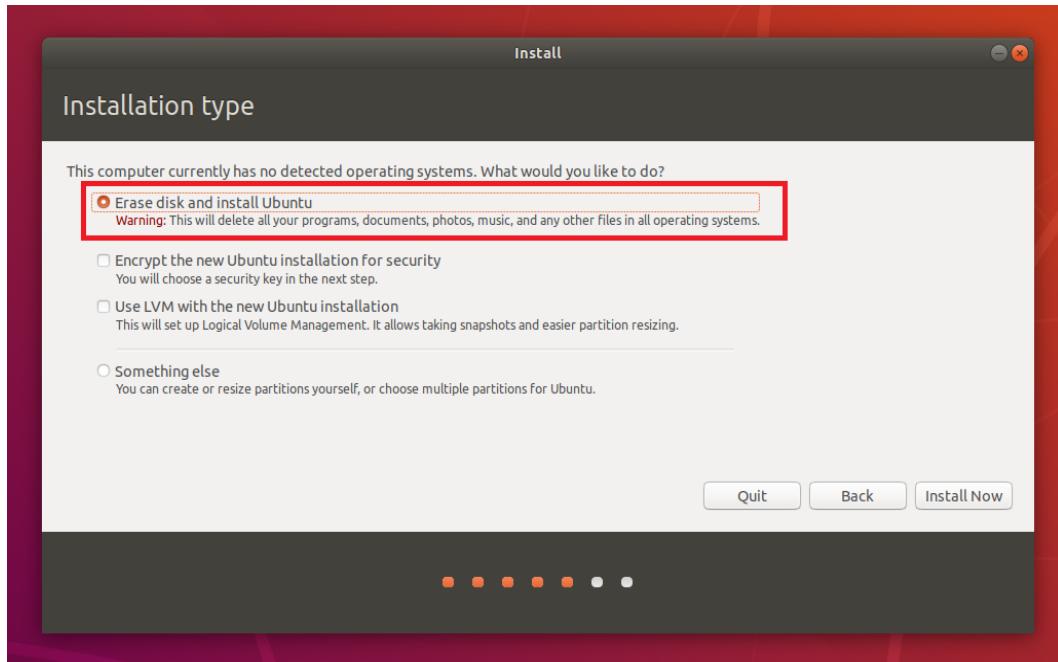


Figure 14: Installation type Screen

18. Select Continue.

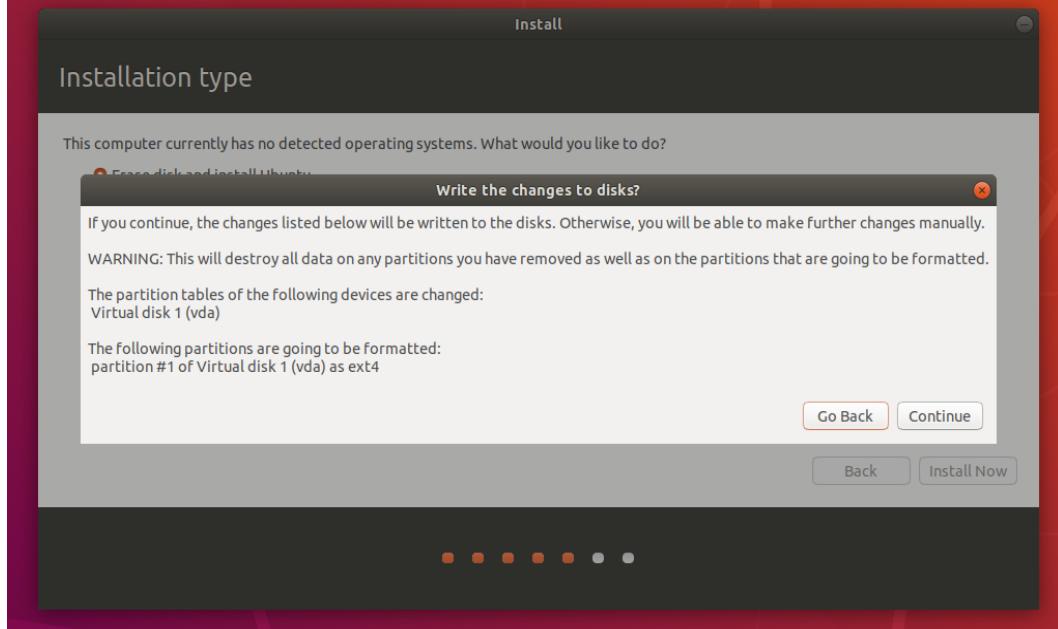


Figure 15: Confirmation Screen

19. Select your **Current Location** and Continue. Select **Continue**.

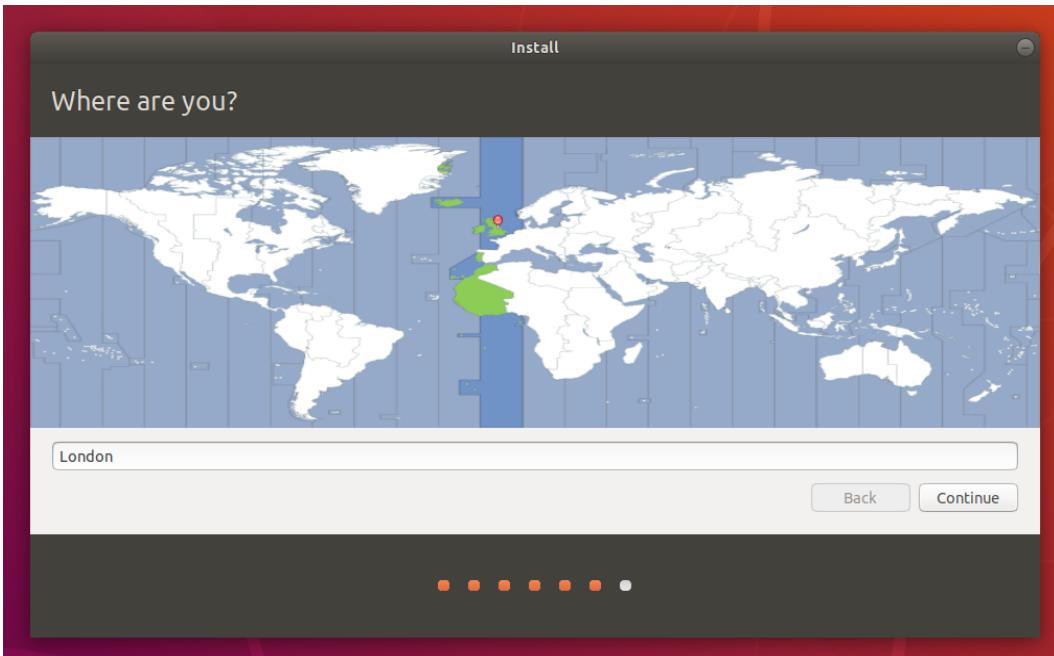


Figure 16: Location selection screen

20. Fill your Info and click **Continue**.

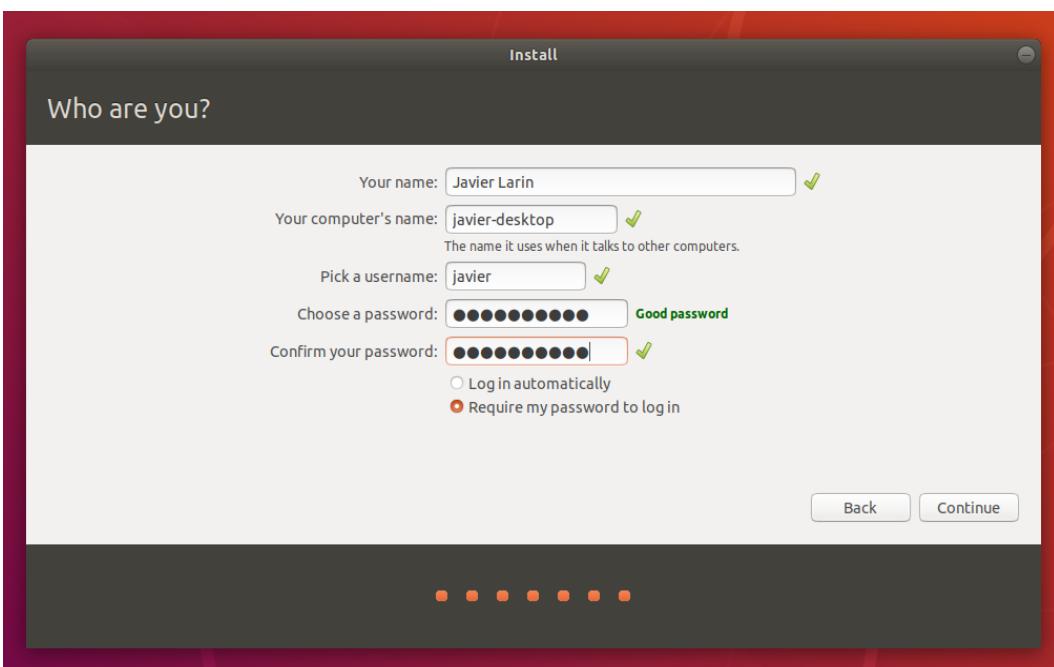


Figure 17: Intro Screen

21. Installation will Continue.

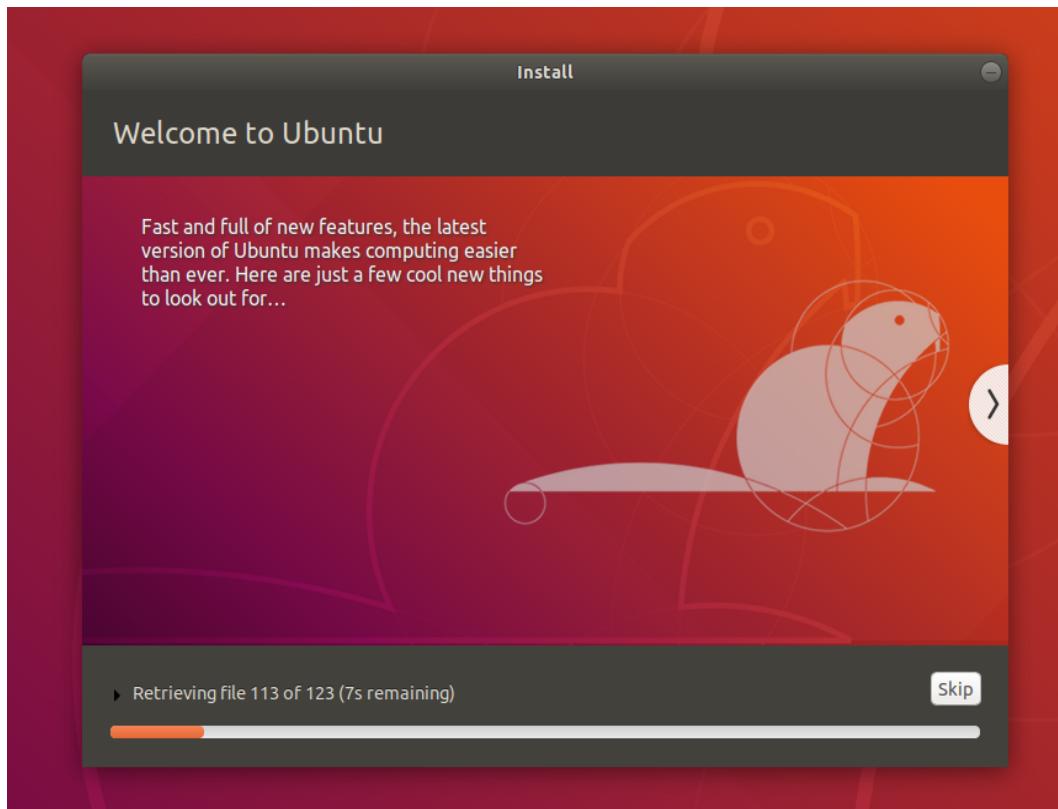


Figure 18: Installation Screen

22. Installation is Complete. Click **Restart Now**.

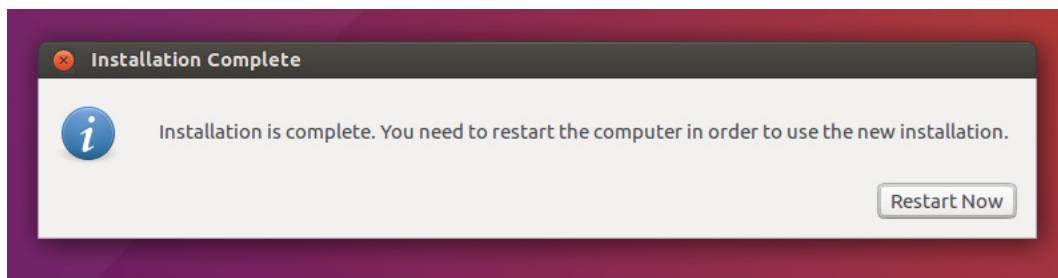


Figure 19: Complete Installation Screen

SpecX can be installed in the Virtual Linux OS normally as described in the previous chapter.

macOS Support

Installing SpecX software on macOS

SpecX is software package for Linux, but macOS users can use SpecX using a Virtual Machine. Follow these steps to initialize a Virtual Machine on your OS X host.

NOTE *SpecX doesn't support 10.10.x (Yosemite) or later running on Intel hardware (PowerPC hardware is not supported nor is building an X11 variant). For installation you need minimum of 2 GB RAM that can be dedicated and 10 GB of storage.*

1. First you have to **download** the image file of the required OS (For Example Ubuntu) from its website or use the following link:

<http://releases.ubuntu.com/18.04.3/ubuntu-18.04.3-desktop-amd64.iso>

2. **Download** the virtualization software (Oracle VM VirtualBox) from the following link:

<https://download.virtualbox.org/virtualbox/6.1.10/VirtualBox-6.1.10-138449-OSX.dmg>

3. **Click** the downloaded dmg file to install the software in macOS host.

4. **Start** Virtual Box, and click on the **New** symbol.



Figure 1: New Virtual OS

- Give the virtual OS a relevant **Name**. Select the **Type** (Linux) and **Version** (Ubuntu 64-bit). Allocate RAM to the virtual OS. Following system has 16GB of RAM so 2GB of RAM is allocated. You can use more RAM if your system has enough extra RAM. **Create** a virtual disk. This works as the hard disk of the virtual Linux system. This is where the virtual system will store its files. Click **Create**.

NOTE *Allocate about half of the RAM to the virtual OS. Click Next.*

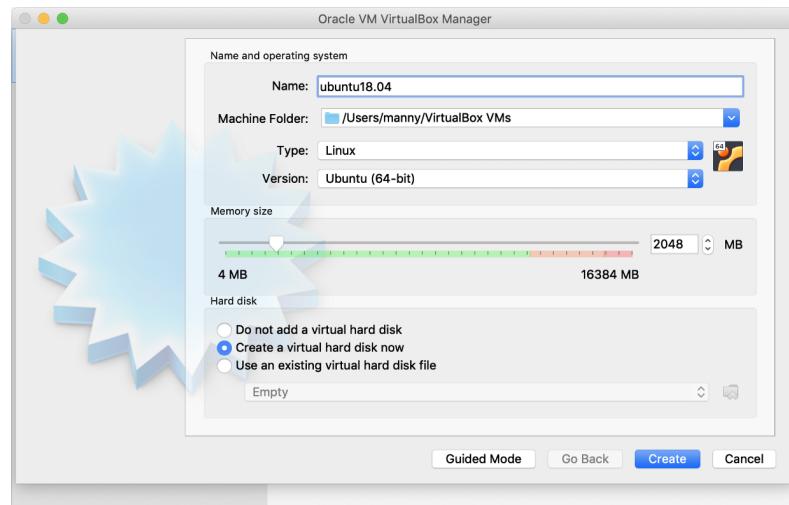


Figure 2: Assigning information

- Select **VDI file type** here (recommended) and Select the **Hard Disk size**. (recommended size: 100 GB). You can choose either of Dynamically allocated or Fixed size option for creating the virtual hard disk. Choose **Dynamically allocated** (recommended). Click **Create**.

NOTE *Dynamic allocation is allocated as time passes and data is increased whereas fixed is allocated instantly.*

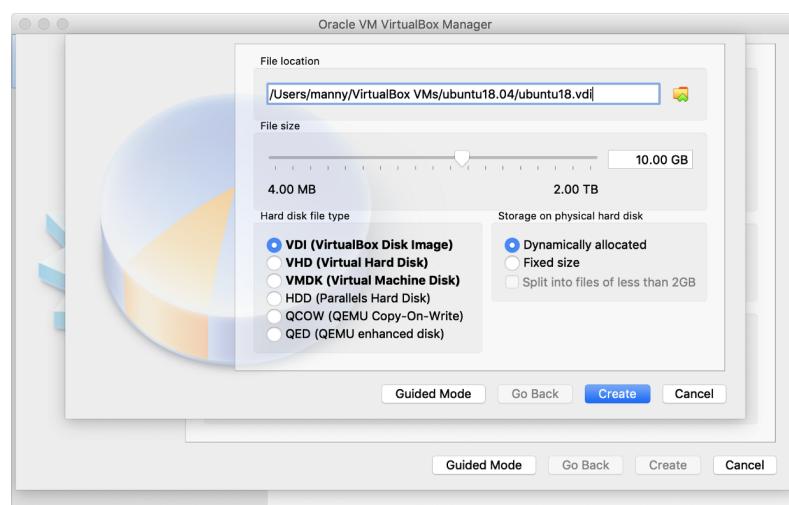


Figure 3: Hard disk file type

7. Once your machine settings are setup, you should see the following:

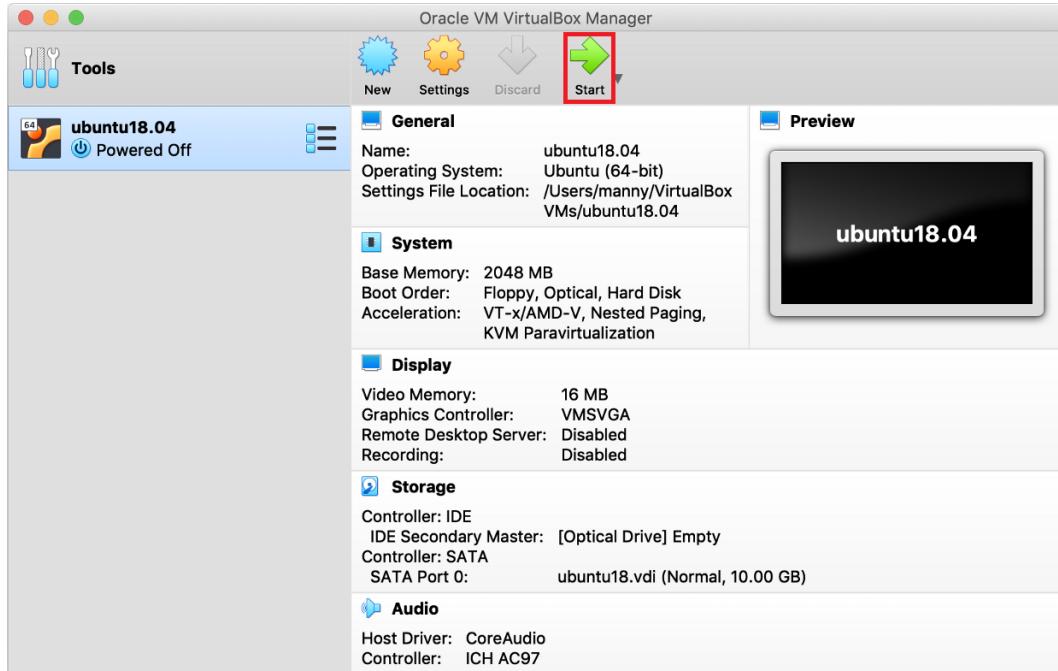


Figure 4: Splash Screen

8. To assign the image file of respective OS to VB. **Select** the machine and just **click** the Green Start Arrow Icon. We'll soon be prompted with the following, where we'll now select our file, and click Start.



Figure 5: Assigning image file

9. Virtual OS will boot into Linux Installation process. You should be presented with the option to install it. Click **Install Ubuntu**.

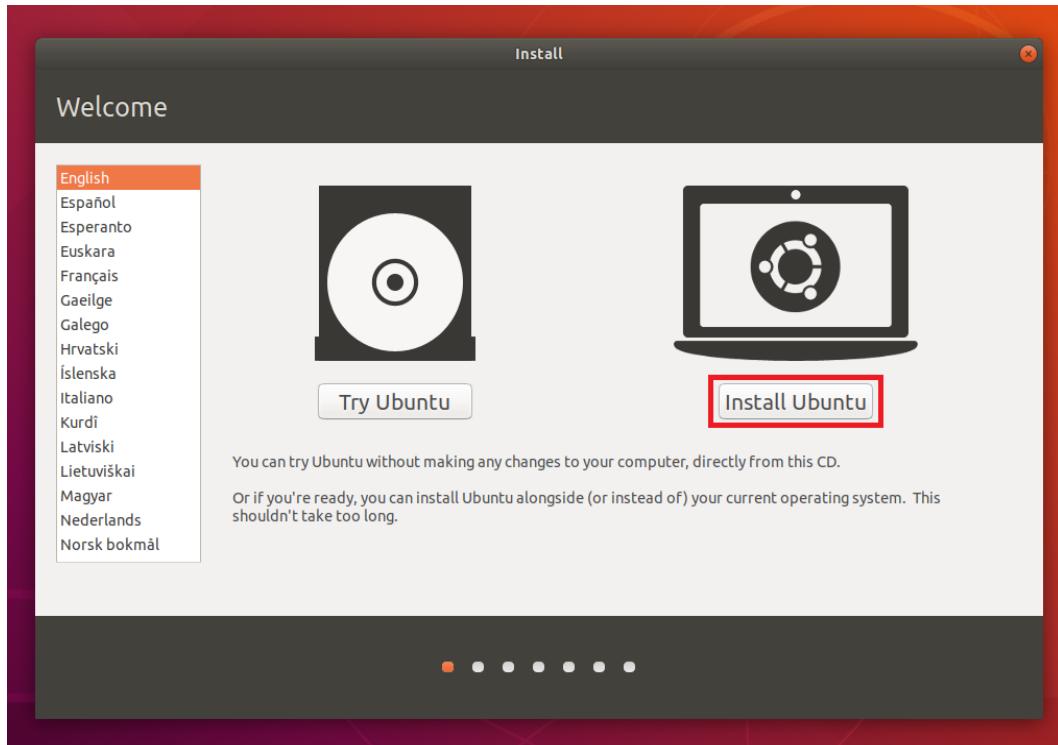


Figure 6: Installing Ubuntu

10. Continue with Normal Installation.

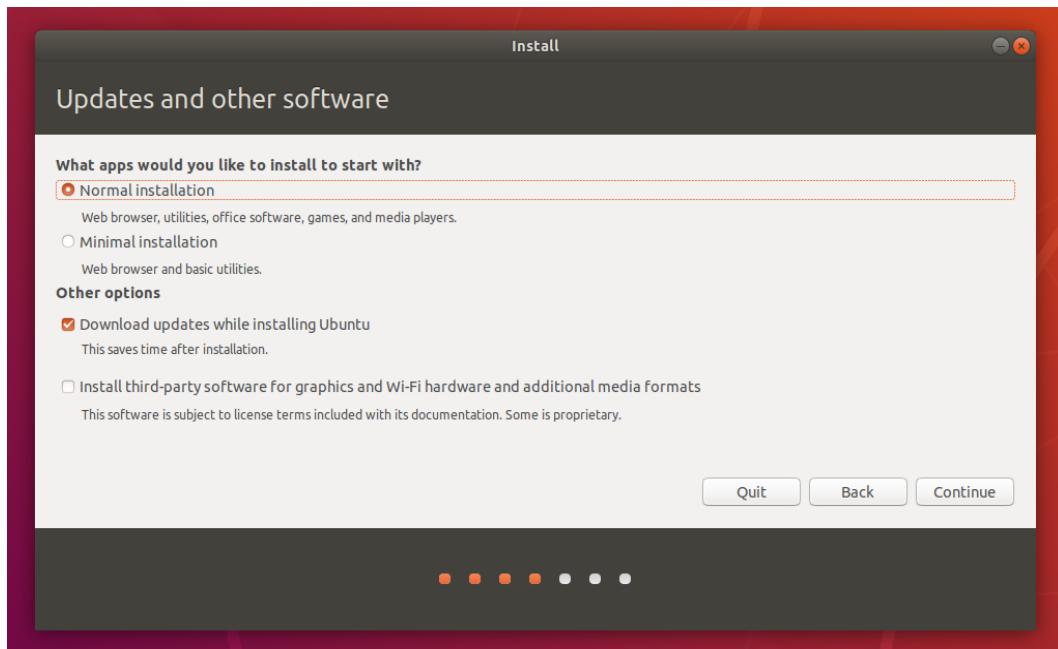


Figure 7: Update Screen

11. In Installation type screen, select **Erase disk** and **Install Now** option.

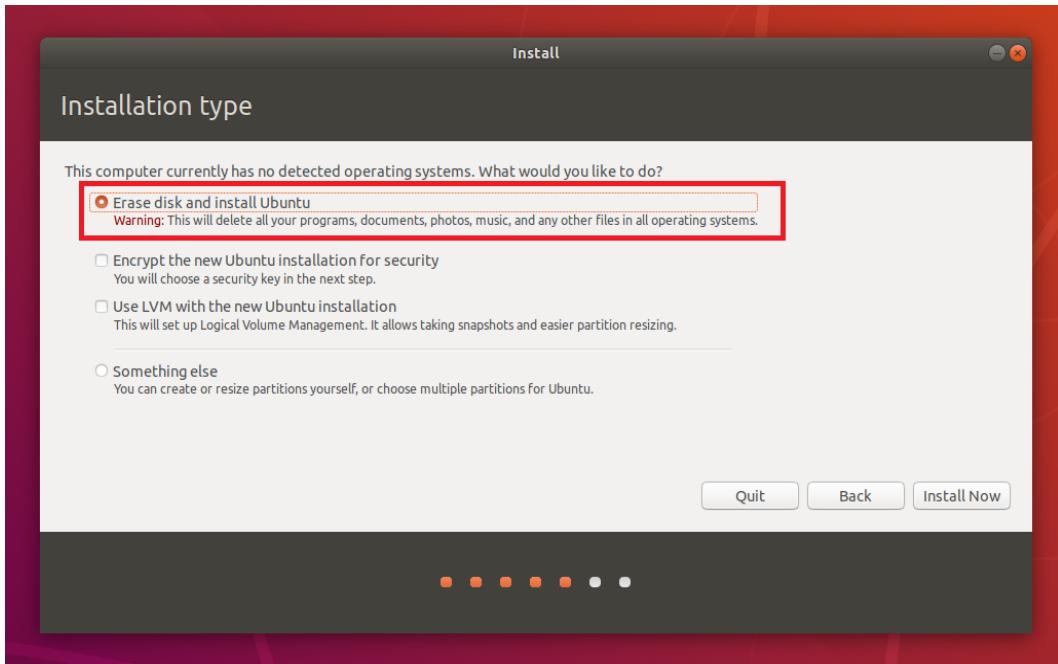


Figure 8: Installation type Screen

12. Select Continue.

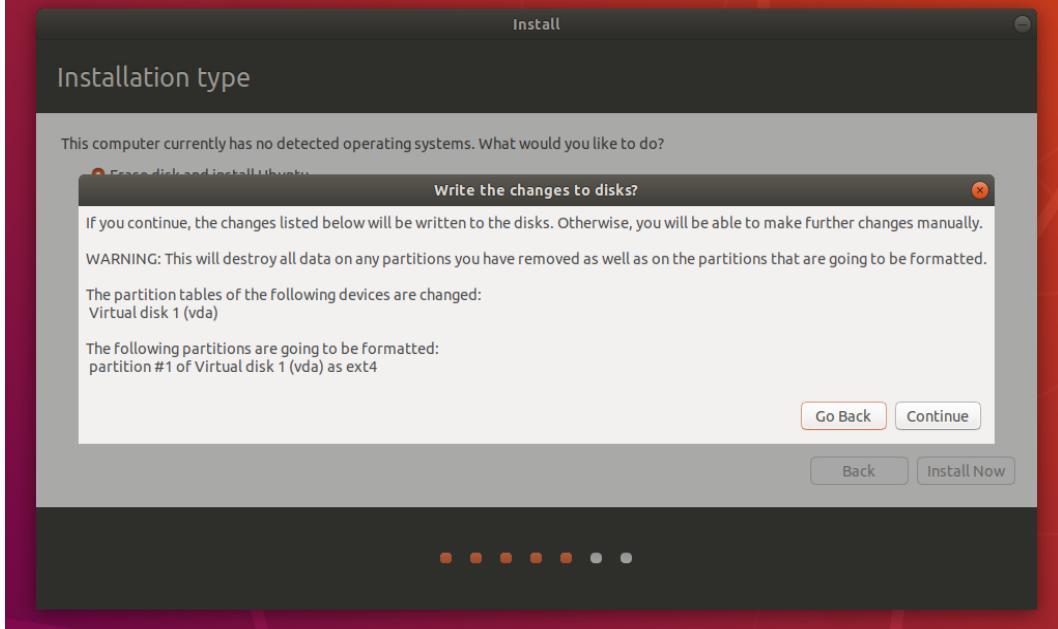


Figure 9: Confirmation Screen

13. Select your **Current Location** and Continue. Select **Continue**.

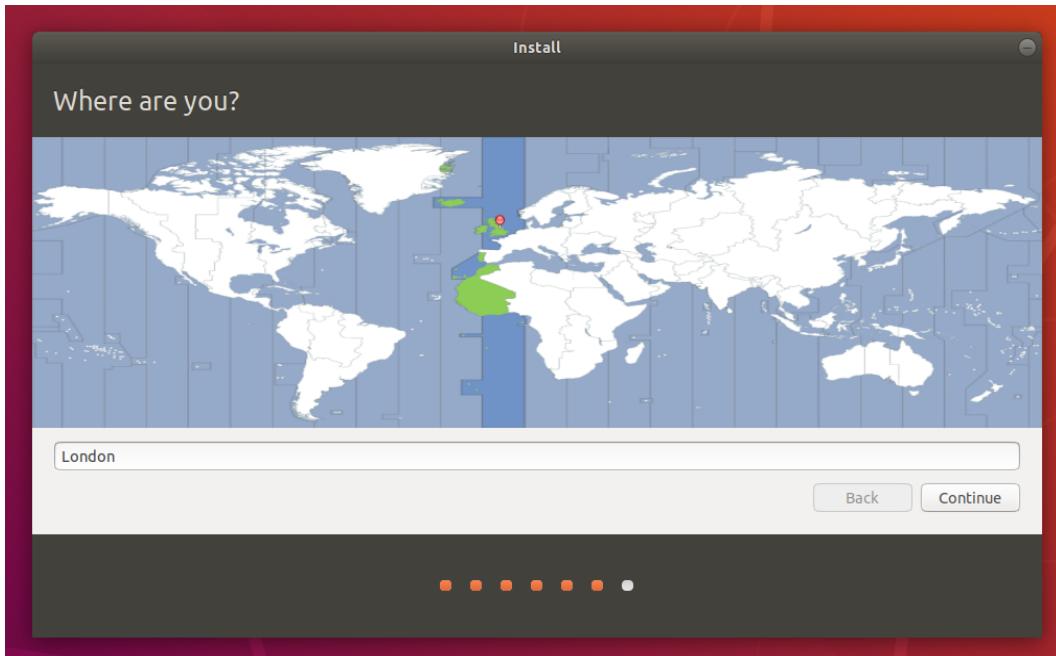


Figure 10: Location selection screen

14. Fill your Info and click **Continue**.

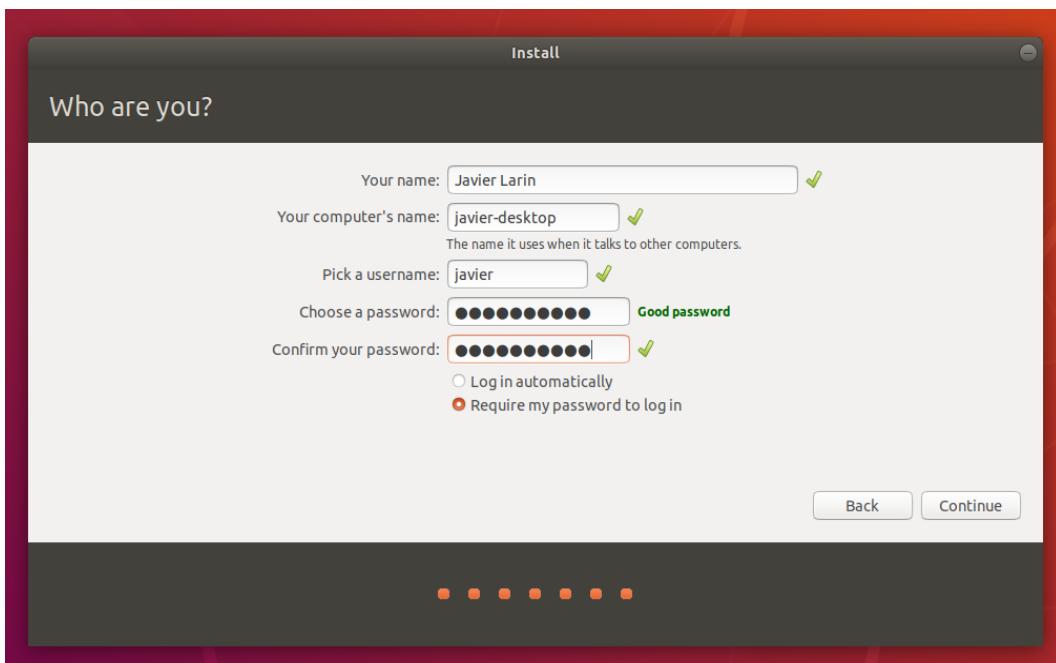


Figure 11: Intro Screen

15. Installation will Continue.

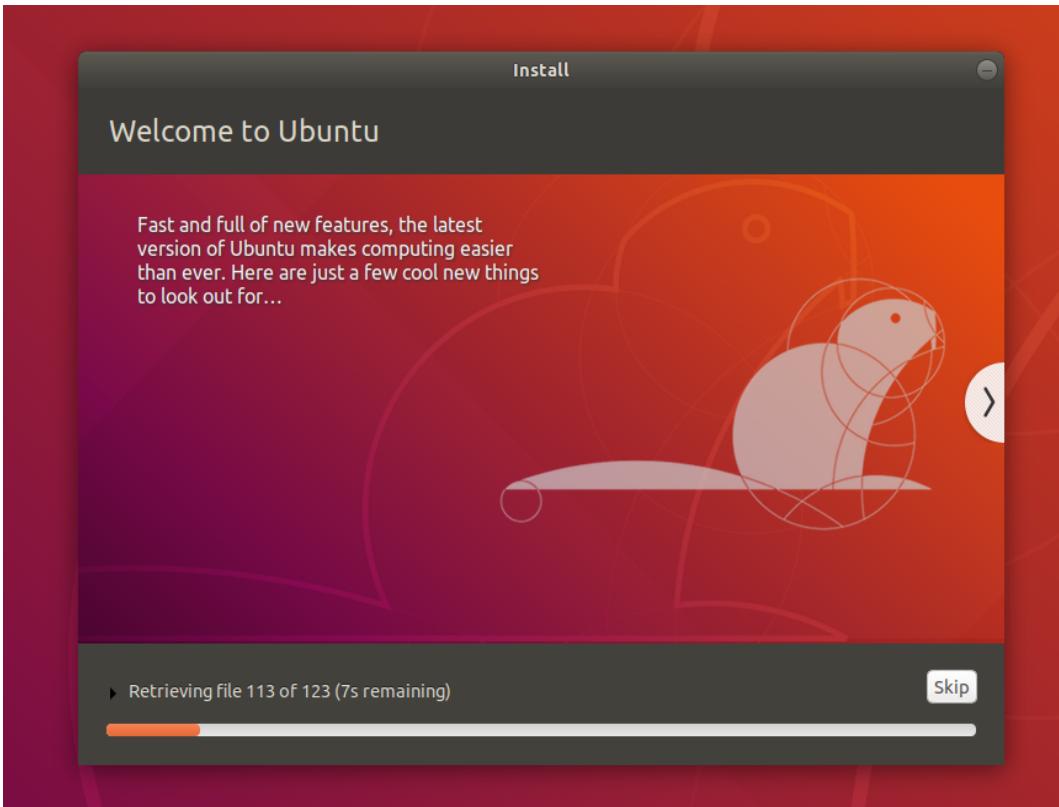


Figure 12: Installation Screen

16. Installation is Complete. Click **Restart Now**.

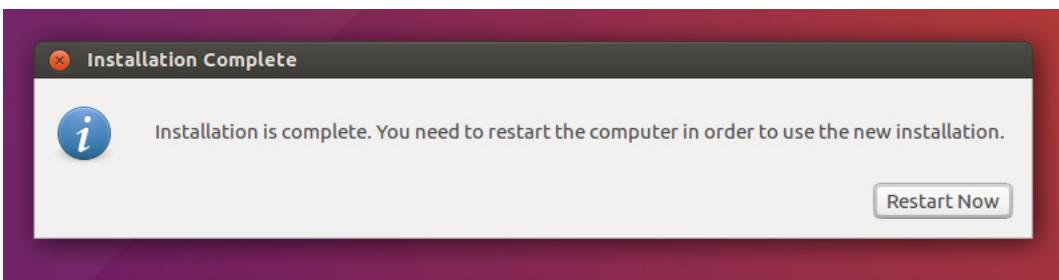


Figure 13: Complete Installation Screen

SpecX can be installed in the Virtual Linux OS normally as described in the previous chapter.

Bibliography

- [1] J. W. Eaton, D. Bateman, and S. Hauberg, *Gnu octave*. Network thoery London, 1997.
- [2] B. W. Char, K. O. Geddes, G. H. Gonnet, B. L. Leong, M. B. Monagan, and S. Watt, *Maple V library reference manual*. Springer Science & Business Media, 2013.
- [3] Z. Hannan, *wxMaxima for Calculus II*. Zachary Hannan, 2015.
- [4] B. Russell and A. N. Whitehead, *Principia mathematica to* 56*. Cambridge University Press Cambridge, UK, 1997, vol. 2.
- [5] N. T. Markov, M. Ercsey-Ravasz, A. Ribeiro Gomes, C. Lamy, L. Magrou, J. Vezoli, P. Misery, A. Falchier, R. Quilodran, M. Gariel *et al.*, "A weighted and directed interareal connectivity matrix for macaque cerebral cortex," *Cerebral cortex*, vol. 24, no. 1, pp. 17–36, 2014.
- [6] C. B. Moler, *Numerical Computing with MATLAB: Revised Reprint*. Siam, 2008, vol. 87.
- [7] P. Zimmermann, A. Casamayou, N. Cohen, G. Connan, T. Dumont, L. Fousse, F. Maltey, M. Meulien, M. Mezzarobba, C. Pernet *et al.*, *Computational mathematics with SageMath*. Siam, 2018, vol. 160.
- [8] A. Karshmer, "Mathomatic blocks: An automated, tactile, interactive method of teaching mathematics to blind students in the k-12 environment," 2007.
- [9] A. N. Anthemidis and K.-I. G. Ioannou, "On-line sequential injection dispersive liquid–liquid microextraction system for flame atomic absorption spectrometric determination of copper and lead in water samples," *Talanta*, vol. 79, no. 1, pp. 86–91, 2009.
- [10] S. L. Campbell, J.-P. Chancelier, and R. Nikoukhah, *Modeling and Simulation in SCILAB*. Springer, 2006.
- [11] S. Kurtenbach, I. Prause, C. Weigel, and B. Corves, "Comparison of geometry software for the analysis in mechanism theory," in *New Trends in Educational Activity in the Field of Mechanism and Machine Theory*. Springer, 2014, pp. 193–201.
- [12] A. Cottrell and R. Lucchetti, "Gretl user's guide," *Distributed with the Gretl library*, 2012.
- [13] M. Hohenwarter and M. Hohenwarter, "Geogebra," Available on-line at <http://www.geogebra.org/cms/en>, 2002.

- [14] G. Fandel, A. Giese, and B. Mohn, "Measuring synergy effects of a public social private partnership (pspp) project," *International Journal of Production Economics*, vol. 140, no. 2, pp. 815–824, 2012.
 - [15] E. Frink, *Elisabeth Frink: Catalogue Raisonné of Sculpture 1947-93*. Ashgate Publishing, Ltd., 2013.
 - [16] K. Atkin, "Using smath studio in physics teaching," *Physics Education*, vol. 54, no. 2, p. 025012, 2019.
 - [17] F. Tilp, *This Was Potomac River*. Tilp, 1978.
 - [18] R. Davies-Colley and J. Nagels, "Effects of dairying on water quality of lowland streams in westland and waikato," in *PROCEEDINGS OF THE CONFERENCE-NEW ZEALAND GRASSLAND ASSOCIATION*, 2002, pp. 107–114.
 - [19] A. Clulow, *The Company and the Shogun: The Dutch Encounter with Tokugawa Japan*. Columbia University Press, 2014.
 - [20] P. F. Kunz, "The hippodraw application and the hippoplot c++ toolkit upon which it is built," Stanford Linear Accelerator Center, Menlo Park, CA (US), Tech. Rep., 2002.
 - [21] P. Karban, F. Mach, P. Kuus, D. Panek, and I. Dolezel, "Numerical solution of coupled problems using code agros2d," *Computing*, vol. 95, no. 1, pp. 381–408, 2013.
 - [22] J. Joubès, S. Raffaele, B. Bourdenx, C. Garcia, J. Laroche-Traineau, P. Moreau, F. Domergue, and R. Lessire, "The vlcfa elongase gene family in arabidopsis thaliana: phylogenetic analysis, 3d modelling and expression profiling," *Plant molecular biology*, vol. 67, no. 5, p. 547, 2008.
 - [23] G. Dhondt, "Calculix crunchix user's manual version 2.12," URL <http://www.dhondt.de/ccx>, vol. 2, 2017.
 - [24] C. G. Von Wangenheim, J. C. Hauck, M. F. Demetrio, R. Pelle, N. da Cruz Alves, H. Barbosa, and L. F. Azevedo, "Codemaster—automatic assessment and grading of app inventor and snap! programs." *Informatics in Education*, vol. 17, no. 1, pp. 117–150, 2018.
 - [25] F. DIANA, "Diana fem-software release 9.4. 4," 2014.
 - [26] T. E. Deal and K. D. Peterson, "Shaping school culture: The heart of leadership," *Adolescence*, vol. 34, no. 136, p. 802, 1999.
 - [27] K. W. Roche, S. Standley, J. McCallum, C. D. Ly, M. D. Ehlers, and R. J. Wenthold, "Molecular determinants of nmda receptor internalization," *Nature neuroscience*, vol. 4, no. 8, pp. 794–802, 2001.
 - [28] D. McKee, "Elmer," *Early Years Educator*, vol. 1, no. 11, pp. 34–37, 2000.
 - [29] M. Alnæs, J. Blechta, J. Hake, A. Johansson, B. Kehlet, A. Logg, C. Richardson, J. Ring, M. E. Rognes, and G. N. Wells, "The fenics project version 1.5," *Archive of Numerical Software*, vol. 3, no. 100, 2015.
 - [30] N. Bracikowski, M. Hecquet, P. Brochet, and S. V. Shirinskii, "Multiphysics modeling of a permanent magnet synchronous machine by using lumped models," *IEEE Transactions on Industrial Electronics*, vol. 59, no. 6, pp. 2426–2437, 2011.
-

-
- [31] E. A. Osuch, E. Vingilis, S. Fisman, and C. Summerhurst, "Early intervention in mood and anxiety disorders: the first episode mood and anxiety program (femap)," *Healthcare Quarterly*, vol. 18, pp. 42–49, 2016.
 - [32] F. Hecht, "New development in freefem++," *Journal of numerical mathematics*, vol. 20, no. 3-4, pp. 251–266, 2012.
 - [33] C. Dodé, N. Le Du^, L. Cuisset, F. Letourneur, J.-M. Berthelot, G. Vaudour, A. Meyrier, R. A. Watts, G. D. Scott, A. Nicholls *et al.*, "New mutations of cias1 that are responsible for muckle-wells syndrome and familial cold urticaria: a novel mutation underlies both syndromes," *The American Journal of Human Genetics*, vol. 70, no. 6, pp. 1498–1506, 2002.
 - [34] D.-S. Ling, L.-F. Bu, G.-Q. Huang, and B. Huang, "h-adaptive enhanced finite element method for plane problems," *Journal of Zhejiang University. Engineering Science*, vol. 45, no. 12, pp. 2150–2158, 2011.
 - [35] J. Zhang, W. Klingsch, and A. Seyfried, "High precision analysis of unidirectional pedestrian flow within the hermes project," *arXiv preprint arXiv:1207.5929*, 2012.
 - [36] J. Armesto, I. Lubowiecka, C. Ordóñez, and F. I. Rial, "Fem modeling of structures based on close range digital photogrammetry," *Automation in Construction*, vol. 18, no. 5, pp. 559–569, 2009.
 - [37] M. d. F. E. M. Lim and D. de Oliveira Lima-Filho, "Condições de trabalho e saúde do/a professor/a universitário/a," *Ciências & Cognição*, vol. 14, no. 3, pp. 62–82, 2009.
 - [38] S. E. Assemani and J. S. Assemanus, *Bibliothecae apostolicae vaticanae codicum manuscriptorum catalogus in tres partes distributus in quarum prima orientales in altera graeci in tertia latini italicici aliorumque europaeorum idiomatum codices: Stephanus Evodius Assemanus arcchiepiscopus apamensis et Joseph Simonius Assemanus ejusdem bilioth. praefectus et sacrossantae Basilicae Principis Apostolorum de Urbe Canonicus recensuerunt digesserunt animaduersinibusque illustrarunt*. Maisonneuve, 1759, vol. 3.
 - [39] B. Patzák, "Oofem—an object-oriented simulation tool for advanced modeling of materials and structures," *Acta Polytechnica*, vol. 52, no. 6, 2012.
 - [40] N. G. Jacobsen, D. R. Fuhrman, and J. Fredsøe, "A wave generation toolbox for the open-source cfd library: Openfoam®," *International Journal for numerical methods in fluids*, vol. 70, no. 9, pp. 1073–1088, 2012.
 - [41] F. McKenna, "Opensees: a framework for earthquake engineering simulation," *Computing in Science & Engineering*, vol. 13, no. 4, pp. 58–66, 2011.
 - [42] Y. Xiong, A. Hubaux, S. She, and K. Czarnecki, "Generating range fixes for software configuration," in *2012 34th International Conference on Software Engineering (ICSE)*. IEEE, 2012, pp. 58–68.
 - [43] S. M. Palacios-Mancilla, M. Á. Rubio-Lezama, M. d. J. de la Torre, A. E. Arrevillaga-López *et al.*, "Metabolic abnormalities and relationship with cardiovascular risk factors in children," *Revista Médica del Instituto Mexicano del Seguro Social*, vol. 50, no. 3, pp. 285–288, 2012.
-

- [44] G. Abaqus, "Abaqus 6.11," *Dassault Systemes Simulia Corporation, Providence, RI, USA*, 2011.
- [45] V. Cubas-Martinez, A. Marco-Ahulló, G. Monfort-Torres, I. Villarrasa-Sapiña, A. Pardo-Ibañez, and X. Garcia-Masso, "Perfiles de actividad física, obesidad, autoestima y relaciones sociales del alumnado de primaria: un estudio piloto con self-organizing maps." *Retos*, vol. 36, no. 36, pp. 146–151, 2019.
- [46] B. Falck, D. Falck, and B. Collette, *Freecad [How-To]*. Packt Publishing Ltd, 2012.
- [47] M. Ould-Khaoua, L. M. Mackenzie, and R. Sotudeh, "Comparative evaluation of hypermesh and multi-stage interconnection networks," *The Computer Journal*, vol. 39, no. 3, pp. 232–240, 1996.
- [48] L. Zhang, "A meta-analysis method to advance design of technology-based learning tool: Combining qualitative and quantitative research to understand learning in relation to different technology features," *Journal of Science Education and Technology*, vol. 23, no. 1, pp. 145–159, 2014.
- [49] W. Younis, *Up and running with Autodesk Inventor Simulation 2011: a step-by-step guide to engineering design solutions*. Elsevier, 2010.
- [50] T. Stolarski, Y. Nakasone, and S. Yoshimoto, *Engineering analysis with ANSYS software*. Butterworth-Heinemann, 2018.
- [51] T. Chien, H. Chang, and W. Lai, "Analysis and mode establishment of information integration activities—a case study perspective," in *2017 IEEE International Conference on Industrial Engineering and Engineering Management (IEEM)*. IEEE, 2017, pp. 480–484.
- [52] C. Multiphysics, "Introduction to comsol multiphysics®," *COMSOL Multiphysics, Burlington, MA, accessed Feb*, vol. 9, p. 2018, 1998.
- [53] P. M. Kurowski and P. Eng, "Engineering analysis with cosmosworks," *Schroff Development Corporation*, 2006.
- [54] J. R. Claycomb, *Applied electromagnetics using QuickField and Matlab*. Laxmi Publications, Ltd, 2010.
- [55] Y. D. Murray *et al.*, "Users manual for ls-dyna concrete material model 159," United States. Federal Highway Administration. Office of Research ..., Tech. Rep., 2007.
- [56] S. E. File, P. J. Kenny, and S. Cheeta, "The role of the dorsal hippocampal serotonergic and cholinergic systems in the modulation of anxiety," *Pharmacology Biochemistry and Behavior*, vol. 66, no. 1, pp. 65–72, 2000.
- [57] E. Q. Sun, "Shear locking and hourgassing in msc nastran, abaqus, and ansys," in *Msc software users meeting*, 2006, pp. 1–9.
- [58] J. Huang, D. Griffiths, and G. A. Fenton, "System reliability of slopes by rfem," *Soils and Foundations*, vol. 50, no. 3, pp. 343–353, 2010.
- [59] M. Winter, "Benchmark and validation of open source cfd codes, with focus on compressible and rotating capabilities, for integration on the simscale platform." Master's thesis, 2014.

-
- [60] K. Chen, S. Gong, T. Xiang, and C. Change Loy, "Cumulative attribute space for age and crowd density estimation," in *Proceedings of the IEEE conference on computer vision and pattern recognition*, 2013.
 - [61] H. Grallert, J. Dupuis, J. C. Bis, A. Dehghan, M. Barbalic, J. Baumert, C. Lu, N. L. Smith, A. G. Uitterlinden, R. Roberts *et al.*, "Eight genetic loci associated with variation in lipoprotein-associated phospholipase a2 mass and activity and coronary heart disease: meta-analysis of genome-wide association studies from five community-based studies," *European heart journal*, vol. 33, no. 2, pp. 238–251, 2012.
 - [62] I. Pană, F. Dinu, and R.-V. Dinu, "Modalities for estimating the wear of the mud pump valves." *Petroleum-Gas University of Ploiești Bulletin, Technical Series*, vol. 70, no. 3, 2018.
 - [63] J. Ten Heggeler, D. Slot, and G. Van der Weijden, "Effect of socket preservation therapies following tooth extraction in non-molar regions in humans: a systematic review," *Clinical oral implants research*, vol. 22, no. 8, pp. 779–788, 2011.
 - [64] W. Yongdong, "Enhancing security check in visual studio c/c++ compiler," in *2009 WRI World Congress on Software Engineering*, vol. 4. IEEE, 2009, pp. 109–113.
 - [65] Z. Pi and F. Khan, "Methods and apparatus to improve performance and enable fast decoding of transmissions with multiple code blocks," Feb. 19 2013, uS Patent 8,379,738.
 - [66] S. K. Satav, S. Satpathy, and K. Satao, "A comparative study and critical analysis of various integrated development environments of c, c++, and java languages for optimum development," *Universal Journal of Applied Computer Science and Technology*, vol. 1, pp. 9–15, 2011.
 - [67] R. Rischpater, *Application development with qt creator*. Packt Publishing Birmingham, 2013.
 - [68] C. H. Builder, *The Icarus Syndrome: The role of air power theory in the evolution and fate of the US Air Force*. Transaction Publishers, 2002.
 - [69] C. Escobar, "Evaluación de los niveles de ruido, iluminación, temperatura y su efecto en las enfermedades profesionales en la empresa codelite sa," *Universidad Técnica de Ambato, Ambato, Ecuador, Tesis Maestria*, 2014.
 - [70] S. O. Bandele and A. S. Adekunle, "Development of c++ application program for solving quadratic equation in elementary school in nigeria." *Journal of Education and Practice*, vol. 6, no. 28, pp. 70–77, 2015.
 - [71] I. Eclipse, "for c/c++ developers (mars)," 2017.
 - [72] P. V. Rego, "Integrating 8-bit avr micro-controllers in ada," *Ada User*, vol. 33, no. 4, p. 301, 2012.
 - [73] B. Gregg and J. Mauro, *DTrace: Dynamic Tracing in Oracle Solaris, Mac OS X, and FreeBSD*. Prentice Hall Professional, 2011.
 - [74] R. K. Panchal and M. A. K. Patel, "A comparative study: Java vs kotlin programming in android," *International journal of Innovative Trends in Engineering & Research*, vol. 2, no. 9, 2017.
-

- [75] D. Leroux, M. Nally, and K. Hussey, "Rational software architect: A tool for domain-specific modeling," *IBM systems journal*, vol. 45, no. 3, pp. 555–568, 2006.
- [76] D. DiMaria and J. Stathis, "Ultimate limit for defect generation in ultra-thin silicon dioxide," *Applied physics letters*, vol. 71, no. 22, pp. 3230–3232, 1997.
- [77] W. Dietz, P. Li, J. Regehr, and V. Adve, "Understanding integer overflow in c/c++," *ACM Transactions on Software Engineering and Methodology (TOSEM)*, vol. 25, no. 1, pp. 1–29, 2015.
- [78] A. Bubnov-Škoberne and G. Strban, *Pravo socialne varnosti*. GV založba, 2010.
- [79] H. M. Deitel and P. J. Deitel, *Visual C# 2010 How to Program*. Pearson Education (US), 2010, no. PUBDB-2017-131289.
- [80] L. Paczkowski, "Replacing monodevelop-unity with visual studio community starting in unity 2018.1," *Luettavissa*: <https://blogs.unity3d.com/2018/01/05/discontinuing-support-for-monodevelop-unity-starting-in-unity-2018-1/>. *Luettu*, vol. 17, 2018.
- [81] M. Koníček, "Debugger frontend for the sharpdevelop ide," 2011.
- [82] P. Lord, C. Sharp, B. Lee, L. Cooper, and H. Grayson, "Raising the standard of work by, with and for children and young people: research and consultation to understand the principles of quality," *Berkshire: National Foundation for Educational Research*, 2012.
- [83] M. Reynolds, *Xamarin Essentials*. Packt Publishing Ltd, 2014.
- [84] J. Brunner, *The shockwave rider*. Open Road Media, 2014.
- [85] D. J. Barnes, M. Kölking, and J. Gosling, *Objects First with Java: A practical introduction using BlueJ*. Pearson/Prentice Hall, 2006.
- [86] D. R. Heffelfinger, *Java EE 5 development with NetBeans 6*. Packt Publishing Ltd, 2008.
- [87] M. Olan, "Dr. j vs. the bird: Java ide's one-on-one," *Journal of Computing Sciences in Colleges*, vol. 19, no. 5, pp. 44–52, 2004.
- [88] L. Vogel, "Eclipse ide tutorial," *Vogella. com*, 2014.
- [89] M. Kölking, "The greenfoot programming environment," *ACM Transactions on Computing Education (TOCE)*, vol. 10, no. 4, pp. 1–21, 2010.
- [90] D. Jemerov, "Implementing refactorings in intellij idea," in *Proceedings of the 2nd Workshop on Refactoring Tools*, 2008, pp. 1–2.
- [91] Y. D. Liang, *Introduction to Java programming with JBuilder 3*. Prentice Hall PTR, 2000.
- [92] C. Ashbacher, "Jcreator 2.0 le," *Mathematics and Computer Education*, vol. 36, no. 1, p. 90, 2002.
- [93] D. Mills, P. Koletzke, and A. Roy-Faderman, *Oracle JDeveloper 11g Handbook*. McGraw-Hill, Inc., 2009.

- [94] J. H. Cross II and T. D. Hendrix, "jgrasp: an integrated development environment with visualizations for teaching java in cs1, cs2, and beyond," *Journal of Computing Sciences in Colleges*, vol. 23, no. 1, pp. 5–7, 2007.
- [95] X. Chaoqun, "The realization of myeclipse and database connection [j]," *Journal of Wuhan Engineering Institute*, vol. 2, 2013.
- [96] X. Brun, S. Sesmat, D. Thomasset, and S. Scavarda, "A comparative study between two control laws of an electropneumatic actuator," in *1999 European Control Conference (ECC)*. IEEE, 1999, pp. 2967–2974.
- [97] P. F. Sweeney, M. Hauswirth, B. Cahoon, P. Cheng, A. Diwan, D. Grove, and M. Hind, "Using hardware performance monitors to understand the behavior of java applications." in *Virtual Machine Research and Technology Symposium*, 2004, pp. 57–72.
- [98] D. Evans, A. Mahgoub, T. Sloan, J. Idle, and R. Smith, "A family and population study of the genetic polymorphism of debrisoquine oxidation in a white british population." *Journal of Medical Genetics*, vol. 17, no. 2, pp. 102–105, 1980.
- [99] Q. N. Islam, *Mastering PyCharm*. Packt Publishing Ltd, 2015.
- [100] K. D. Lee and S. Hubbard, "Python programming 101," in *Data Structures and Algorithms with Python*. Springer, 2015, pp. 1–40.
- [101] D. Offenbach, "The eric python ide." [Online]. Available: <https://eric-ide.python-projects.org/>
- [102] A. Ottosson, "Implementering av calfem för python," 2010.
- [103] F. Langroonet, "Kdevelop," 2010.
- [104] K. Stage, "Python programming."
- [105] J. Businge, A. Serebrenik, and M. van den Brand, "An empirical study of the evolution of eclipse third-party plug-ins," in *Proceedings of the Joint ERCIM Workshop on Software Evolution (EVOL) and International Workshop on Principles of Software Evolution (IWPSE)*, 2010, pp. 63–72.
- [106] L. Mercier, *Anaconda: labor, community, and culture in Montana's smelter city*. University of Illinois Press, 2001, vol. 296.
- [107] T. Horodnia and T. Pyzo, "Optimization of the cost of production of the enterprise," *Naukovyj visnyj NLTU Ukrayny*, vol. 21, pp. 326–330, 2011.
- [108] E. Dillon, M. Anderson, and M. Brown, "Comparing feature assistance between programming environments and their" effect" on novice programmers," *Journal of Computing Sciences in Colleges*, vol. 27, no. 5, pp. 69–77, 2012.
- [109] A. Annamaa, "Introducing thonny, a python ide for learning programming," in *Proceedings of the 15th Koli Calling Conference on Computing Education Research*, 2015, pp. 117–121.
- [110] J. Brownlee, *Machine Learning Mastery With Python: Understand Your Data, Create Accurate Models, and Work Projects End-to-End*. Machine Learning Mastery, 2016.

- [111] T. Deuling, *Aptana Studio Beginner's Guide*. Packt Publishing Ltd, 2013.
 - [112] C. Simonet, "Geologie des gisements de saphir et de rubis: l'exemple de la john saul ruby mine, mangare, kenya," Ph.D. dissertation, Nantes, 2000.
 - [113] N. Feng, J. Xie, and Y. Wu, "Comparison of ruby on rails development tools," in *2009 WRI World Congress on Software Engineering*, vol. 4. IEEE, 2009, pp. 290–294.
 - [114] C. Kutler and B. Leonard, *NetBeans Ruby and Rails IDE with JRuby*. Apress, 2009.
 - [115] P. Charles, R. M. Fuhrer, S. M. Sutton Jr, E. Duesterwald, and J. Vinju, "Accelerating the creation of customized, language-specific ides in eclipse," *ACM Sigplan Notices*, vol. 44, no. 10, pp. 191–206, 2009.
 - [116] A. Feldthaus, M. Schäfer, M. Sridharan, J. Dolby, and F. Tip, "Efficient construction of approximate call graphs for javascript ide services," in *2013 35th International Conference on Software Engineering (ICSE)*. IEEE, 2013, pp. 752–761.
 - [117] I. Morishima, A. Nogami, H. Tsuboi, and T. Sone, "Negative participation of the left posterior fascicle in the reentry circuit of verapamil-sensitive idiopathic left ventricular tachycardia," *Journal of cardiovascular electrophysiology*, vol. 23, no. 5, pp. 556–559, 2012.
 - [118] C. Baikouzis and M. O. Magnasco, "Is an eclipse described in the odyssey?" *Proceedings of the National Academy of Sciences*, vol. 105, no. 26, pp. 8823–8828, 2008.
 - [119] R. S. Graves, J. D. Mahnken, R. H. Swerdlow, J. M. Burns, C. Price, B. Amstein, S. L. Hunt, L. Brown, B. Adagarla, and E. D. Vidoni, "Open-source, rapid reporting of dementia evaluations," *Journal of registry management*, vol. 42, no. 3, p. 111, 2015.
 - [120] R. Warner and R. Harris, "Editing text," in *The Definitive Guide to SWT and JFace*. Springer, 2004, pp. 739–772.
 - [121] A. Dreamweaver, "Adobe dreamweaver cc," *Retrieved April*, vol. 23, 2014.
 - [122] Y. Kosmann-Schwarzbach, "Derived brackets," *Letters in Mathematical Physics*, vol. 69, no. 1, pp. 61–87, 2004.
 - [123] S. Talekar, *WebStorm: Web based support tool for organization of requirements modeling*. University of Nevada, Reno, 2008.
 - [124] R. F. Araujo, *Getting Started with Eclipse Juno*. Packt Publishing Ltd, 2013.
 - [125] R. Liu, T.-t. Zhang, D. Zhou, X.-y. Bai, W.-l. Zhou, C. Huang, J.-k. Song, F.-r. Meng, C.-x. Wu, L. Li *et al.*, "Quercetin protects against the $\alpha\beta25-35$ -induced amnesic injury: Involvement of inactivation of rage-mediated pathway and conservation of the nvu," *Neuropharmacology*, vol. 67, pp. 419–431, 2013.
 - [126] B. Mills *et al.*, "Software testing: The seamonkey project," 2010.
 - [127] M. Ryan, K. Gerard, and M. Amaya-Amaya, *Using discrete choice experiments to value health and health care*. Springer Science & Business Media, 2007, vol. 11.
 - [128] C. Tomer, "Creating css with kompozer," 2007.
-

-
- [129] T. DeMarco, "Sigil, bluegriffon, and the evolving software market," *IEEE Software*, no. 4, pp. 100–100, 2014.
 - [130] C. Bentow, G. Lakos, R. Rosenblum, C. Bryant, A. Seaman, and M. Mahler, "Clinical performance evaluation of a novel, automated chemiluminescent immunoassay, quanta flash ctd screen plus," *Immunologic research*, vol. 61, no. 1-2, pp. 110–116, 2015.
 - [131] H. Sun, J. Thangarajah, and L. Padgham, "Eclipse-based prometheus design tool," in *AAMAS 2010*. IFAAMAS, 2010, pp. 1769–1770.
 - [132] C. Petzold, *Creating Mobile Apps with Xamarin. Forms Preview Edition 2*. Microsoft Press, 2015.
 - [133] D. Chapman, *Joomla! 1.5x Customization: Make Your Site Adapt to Your Needs: Create and Customize a Professional Joomla! Site That Suits Your Business Requirements*. Packt Publishing Ltd, 2009.
 - [134] M. Chaudhary and A. Kumar, *PhpStorm Cookbook*. Packt Publishing Ltd, 2014.
 - [135] A. Khataee, T. S. Rad, B. Vahid, and S. Khorram, "Preparation of zeolite nanorods by corona discharge plasma for degradation of phenazopyridine by heterogeneous sono-fenton-like process," *Ultrasonics sonochemistry*, vol. 33, pp. 37–46, 2016.
 - [136] J. Coggeshall and M. Tocker, "Introduction to zend studio for eclipse," *Zend Enterprise PHP Patterns*, pp. 33–55, 2009.
 - [137] D. I. Inan and R. Juita, "Analysis and design complex and large data base using mysql workbench," *International Journal of Computer Science & Information Technology*, vol. 3, no. 5, p. 173, 2011.
 - [138] M. Delisle, *Mastering phpMyAdmin 3.1 for effective MySQL management*. Packt Publishing Ltd, 2009.
 - [139] A. Suárez Cueto *et al.*, "Usuario mysql y heidisql," *Fundamentos de las Bases de Datos*, 2013.
 - [140] C.-M. Lin, Y.-L. Hsieh, K.-C. Yin, M.-C. Hung, and D.-L. Yang, "Adminer: An incremental data mining approach using a compressed fp-tree." *JSW*, vol. 8, no. 8, pp. 2095–2103, 2013.
 - [141] G. Ozar, *MySQL management and administration with Navicat*. Packt Publishing Ltd, 2012.
 - [142] S. K. Gupta, *Oracle Advanced PL/SQL Developer Professional Guide*. Packt Publishing Ltd, 2012.
 - [143] J. D. Beaver, A. D. Lawrence, J. Van Ditzhuijzen, M. H. Davis, A. Woods, and A. J. Calder, "Individual differences in reward drive predict neural responses to images of food," *Journal of Neuroscience*, vol. 26, no. 19, pp. 5160–5166, 2006.
 - [144] D. Bartholomew, "Mariadb vs. mysql," *Dostopano*, vol. 7, no. 10, p. 2014, 2012.
 - [145] J. Kreibich, *Using SQLite*. "O'Reilly Media, Inc.", 2010.
 - [146] P. d. F. de Curso, "Desenvolvimento e aplicação de agentes web inteligentes para pesquisa de publicações científicas nas áreas da biomedicina e bioinformática," 2011.

- [147] J. M. P. Gómez, *UF2177-Desarrollo de programas en el entorno de la base de datos*. Ediciones Paraninfo, SA, 2015.
- [148] Y. Gu, J. Warren, J. Stanek, and G. Suthers, "A system architecture design for knowledge management (km) in medical genetic testing (mgt) laboratories," in *2006 10th International Conference on Computer Supported Cooperative Work in Design*. IEEE, 2006, pp. 1–6.
- [149] M. de Jong and A. van Deursen, "Continuous deployment and schema evolution in sql databases," in *2015 IEEE/ACM 3rd International Workshop on Release Engineering*. IEEE, 2015, pp. 16–19.
- [150] A. Heryandi, "Program-program mysql," 2011.
- [151] B. S. Kasamani and D. Litunya, "Activity logging in a bring your own application environment for digital forensics," in *Fourth International Congress on Information and Communication Technology*. Springer, 2020, pp. 241–257.
- [152] A. Jakalian, D. B. Jack, and C. I. Bayly, "Fast, efficient generation of high-quality atomic charges. aml-bcc model: li. parameterization and validation," *Journal of computational chemistry*, vol. 23, no. 16, pp. 1623–1641, 2002.
- [153] R. Zenit and M. Hunt, "The impulsive motion of a liquid resulting from a particle collision," *Journal of Fluid Mechanics*, vol. 375, pp. 345–361, 1998.
- [154] J. Isnardo Altamirano, "Análisis de información mediante la plataforma free open source de crowdsourcing pybossa," 2015.
- [155] J. M. Harding, "Regression testing of sql execution plans for sql statements," Feb. 28 2017, uS Patent 9,582,409.
- [156] M. Sardella, "Studio di un sistema epidemiologico integrato con implementazione di un algoritmo per la sorveglianza del diabete," 2015.
- [157] E. Toombs, "Microsoft sql server forensic analysis," Ph.D. dissertation, Utica College, 2015.
- [158] K. Manning, A. Timpson, S. Colledge, E. Crema, and S. Shennan, "The cultural evolution of neolithic europe. euroevol dataset," 2015.
- [159] D. W. Estes and R. J. Stack, "Bi-phasic applications of real & imaginary separation, and reintegration in the time domain," Nov. 6 2014, uS Patent App. 14/337,030.
- [160] S. Dobson, P. Nixon, V. Wade, S. Terzis, and J. Fuller, "Vanilla: an open language framework," in *International Symposium on Generative and Component-Based Software Engineering*. Springer, 1999, pp. 91–104.
- [161] R. Ducournau, "Master mention informatique parcours aigle," *Université de Montpellier*, 2015.
- [162] M. Laurson, M. Kuuskankare, and V. Norilo, "An overview of pwgl, a visual programming environment for music," *Computer Music Journal*, vol. 33, no. 1, pp. 19–31, 2009.
- [163] I. Haulsen and A. Sodan, "Unicstep-a visual stepper for common lisp: portability and language aspects," *ACM SIGPLAN Lisp Pointers*, vol. 3, no. 1, pp. 35–43, 1989.

- [164] D. Widyatmoko, "Autecology and conservation management of a rare palm species: the case study of lispstick palm cyrtostachys renda blume in 47 kerumutan wildlife sanctuary, riau [disertasi]," 2001.
- [165] J. T. Bonner, *Cellular slime molds*. Princeton University Press, 2015.
- [166] Z. Beane, "Quicklisp," 2012.
- [167] S. Furuto, "Theoretical perspectives for culturally competent practice with immigrant children and families," *Culturally competent practice with immigrant and refugee children and families*, pp. 19–38, 2004.
- [168] K. Lakhotia, P. McMinn, and M. Harman, "An empirical investigation into branch coverage for c programs using cute and austin," *Journal of Systems and Software*, vol. 83, no. 12, pp. 2379–2391, 2010.
- [169] B. Wing, B. Lewis, D. LaLiberte, and R. Stallman, "Xemacs lisp reference manual," *Part of the XEmacs distribution*, 1999.
- [170] T. Raman, "Emacspeak—direct speech access," in *Proceedings of the second annual ACM conference on Assistive technologies*, 1996, pp. 32–36.
- [171] H. Yu, D. Pardoll, and R. Jove, "Stats in cancer inflammation and immunity: a leading role for stat3," *Nature reviews cancer*, vol. 9, no. 11, pp. 798–809, 2009.
- [172] J. Allaire, "Rstudio: integrated development environment for r," *Boston, MA*, vol. 537, p. 538, 2012.
- [173] S. Rödiger, T. Friedrichsmeier, P. Kapat, M. Michalke *et al.*, "Rkward: a comprehensive graphical user interface and integrated development environment for statistical analysis with r," *Journal of Statistical Software*, vol. 49, no. 9, pp. 1–34, 2012.
- [174] E. Haughee, *Instant Sublime Text Starter*. Packt Publ., 2013.
- [175] D. Ho *et al.*, "Notepad++," Retrieved from: <http://notepad-plus-plus.org>, 2011.
- [176] K. Sumangali, L. Borra, and A. Suraj Mishra, "A comprehensive review on the open source hackable text editor-atom," in *Materials Science and Engineering Conference Series*, vol. 263, no. 4, 2017, p. 042061.
- [177] J. Schauber, R. A. Dorschner, A. B. Coda, A. S. Büchau, P. T. Liu, D. Kiken, Y. R. Helfrich, S. Kang, H. Z. Elalieh, A. Steinmeyer *et al.*, "Injury enhances tlr2 function and antimicrobial peptide expression through a vitamin d-dependent mechanism," *The Journal of clinical investigation*, vol. 117, no. 3, pp. 803–811, 2007.
- [178] J. McNeill, F. Barrie, W. Buck, V. Demoulin, W. Greuter, D. Hawksworth, P. Herendeen, S. Knapp, K. Marhold, J. Prado *et al.*, *International Code of Nomenclature for algae, fungi and plants (Melbourne Code)*. Koeltz Scientific Books Königstein, 2012, vol. 154.
- [179] J. L. NÚÑez, J. Martín-Albo, J. G. Navarro, and V. M. González, "Preliminary validation of a spanish version of the sport motivation scale," *Perceptual and Motor Skills*, vol. 102, no. 3, pp. 919–930, 2006.
- [180] M. Wenzel, "Isabelle/jedit—a prover ide within the pide framework," in *International Conference on Intelligent Computer Mathematics*. Springer, 2012, pp. 468–471.

- [181] W. P. Maddison and M. C. Hedin, "Jumping spider phylogeny (araneae: Salticidae)," *Invertebrate systematics*, vol. 17, no. 4, pp. 529–549, 2003.
- [182] A. Vallières-Lagacé, "Ultraedit pour mac [test]," 2012.
- [183] F. Juanes and D. O. Conover, "Piscivory and prey size selection in young-of-the-year bluefish: predator preference or size-dependent capture success?" *Marine Ecology Progress Series*, pp. 59–69, 1994.
- [184] M. Crainic and R. L. Fernandes, "Integrability of lie brackets," *Annals of Mathematics*, pp. 575–620, 2003.
- [185] C. Apers and D. Paterson, "Development tools," in *Beginning iPhone and iPad Web Apps*. Springer, 2010, pp. 3–11.
- [186] J. R. Cruz, "Bbedit language modules adding new language support to bbedit and textwrangler," *MacTech Magazine*, p. 60, 2010.
- [187] C. G. Otoni, M. R. de Moura, F. A. Aouada, G. P. Camilloto, R. S. Cruz, M. V. Lorevice, N. de FF Soares, and L. H. Mattoso, "Antimicrobial and physical-mechanical properties of pectin/papaya puree/cinnamaldehyde nanoemulsion edible composite films," *Food Hydrocolloids*, vol. 41, pp. 188–194, 2014.
- [188] J. Hurst, *Professional SlickEdit*. John Wiley & Sons, 2007.
- [189] J. Margolin, "Digital map generator and display system," Feb. 8 2000, uS Patent 6,023,278.
- [190] I. Letchumanan, S. C. Gopinath, M. M. Arshad, P. Anbu, and T. Lakshmipriya, "Gold nano-urchin integrated label-free amperometric aptasensing human blood clotting factor ix: A prognosticative approach for "royal disease"," *Biosensors and Bioelectronics*, vol. 131, pp. 128–135, 2019.
- [191] Z. Aghili, N. Nasirizadeh, A. Divsalar, S. Shoeibi, and P. Yaghmaei, "A nanobiosensor composed of exfoliated graphene oxide and gold nano-urchins, for detection of gmo products," *Biosensors and Bioelectronics*, vol. 95, pp. 72–80, 2017.
- [192] D. Macos and F. Mueller, "Integrating gnat/gcc into a timing analysis environment," in *Work-in-Progress of EuroMicro Workshop on Real-Time Systems*, 1998, pp. 15–18.
- [193] S. P. Dandamudi, "Overview of assembly language," *Fundamentals of Computer Organization and Design*, pp. 321–385, 2003.
- [194] X. Jin, V. V. Balasubramanian, S. T. Selvan, D. P. Sawant, M. A. Chari, G. e. Lu, and A. Vinu, "Highly ordered mesoporous carbon nitride nanoparticles with high nitrogen content: a metal-free basic catalyst," *Angewandte Chemie International Edition*, vol. 48, no. 42, pp. 7884–7887, 2009.
- [195] H. Kalla, J.-P. Talpin, D. Berner, and L. Besnard, "Automated translation of c/c++ models into a synchronous formalism," in *13th Annual IEEE International Symposium and Workshop on Engineering of Computer-Based Systems (ECBS'06)*. IEEE, 2006, pp. 9–pp.
- [196] E. Dumbill, E. Wilder-James, and N. M. Bornstein, *Mono: A Developer's Notebook*. "O'Reilly Media, Inc.", 2004.

-
- [197] R. Lämmel and C. Verhoef, "Semi-automatic grammar recovery," *Software: Practice and Experience*, vol. 31, no. 15, pp. 1395–1438, 2001.
 - [198] N. A. Naeem and L. Hendren, "Programmer-friendly decompiled java," in *14th IEEE International Conference on Program Comprehension (ICPC'06)*. IEEE, 2006, pp. 327–336.
 - [199] L. Wall, T. Christiansen, J. Orwant, and J. Samela, *Perl*. Satku, 2002.
 - [200] M. Lutz, *Programming python*. "O'Reilly Media, Inc.", 2001.
 - [201] C. Flynt, *Tcl/Tk: A Developer's Guide*. Elsevier, 2012.
 - [202] D. Thomas, A. Hunt, and C. Fowler, *Programming Ruby 1.9 & 2.0: The Pragmatic Programmers' Guide*. Pragmatic Bookshelf, 2013.
 - [203] H. Zhang, P. Meltzer, and S. Davis, "Rcircos: an r package for circos 2d track plots," *BMC bioinformatics*, vol. 14, no. 1, p. 244, 2013.
 - [204] A. A. Beltran, C. D. Hiwatig, N. J. R. Laguna-Agustin, and M. B. Villanueva, "Teaching electronic circuits using altium designer," *International Journal of Scientific Engineering and Technology*, vol. 3, no. 10, pp. 1239–1243, 2014.
 - [205] R. D. Murtagh, J. T. Caracciolo, and G. Fernandez, "Ct findings associated with eagle syndrome," *American Journal of Neuroradiology*, vol. 22, no. 7, pp. 1401–1402, 2001.
 - [206] P. Mittal and J. Singh, "Use of open source software in engineering," *International Journal of Advanced Research in Computer Engineering & Technology (IJARCET)*, vol. 2, no. 3, 2013.
 - [207] Y.-S. Lee, B.-Y. Lin, Y.-H. Hsu, B.-Y. Chang, and N.-S. Lin, "Subgenomic rnas of bamboo mosaic potexvirus-v isolate are packaged into virions." *Journal of general virology*, vol. 79, no. 7, pp. 1825–1832, 1998.
 - [208] M. Köfferlein, "Klayout," 2018.
 - [209] E. KiCad, "A cross platform and open source electronics design automation suite," Disponible en: <http://kicad-pcb.org>, 2017.
 - [210] V. Kohli, D. Sankaran, and S. R. Durrill, "Pin unspecific device planning for printed circuit board layout," Sep. 18 2012, uS Patent 8,271,933.
 - [211] A. Knörig, R. Wettach, and J. Cohen, "Fritzing: a tool for advancing electronic prototyping for designers," in *Proceedings of the 3rd International Conference on Tangible and Embedded Interaction*, 2009, pp. 351–358.
 - [212] B. Su and L. Wang, "Application of proteus virtual system modelling (vsm) in teaching of microcontroller," in *2010 International Conference on E-Health Networking Digital Ecosystems and Technologies (EDT)*, vol. 2. IEEE, 2010, pp. 375–378.
 - [213] V. Zivkovic, "Simulide (diptera, simuliidae) koje napadaju coveka i domace zivotinje," *Acta Vet Beograd*, 1970.
 - [214] T. Lampert, L. Kroll, S. Müters, and H. Stolzenberg, "Measurement of the socioeconomic status within the german health update 2009 (geda)," *Bundesgesundheitsblatt, Gesundheitsforschung, Gesundheitsschutz*, vol. 56, no. 1, pp. 131–143, 2013.
-

- [215] M. Brinson and S. Jahn, "Qucs: A gpl software package for circuit simulation, compact device modelling and circuit macromodelling from dc to rf and beyond," *International Journal of Numerical Modelling: Electronic Networks, Devices and Fields*, vol. 22, no. 4, pp. 297–319, 2009.
- [216] Y. D. Save, R. Rakhi, N. Shambhulingayya, A. Srivastava, M. R. Das, S. Choudhary, and K. M. Moudgalya, "Oscad: An open source eda tool for circuit design, simulation, analysis and pcb design," in *2013 IEEE 20th International Conference on Electronics, Circuits, and Systems (ICECS)*. IEEE, 2013, pp. 851–854.
- [217] P. P. Chu, *FPGA prototyping by VHDL examples: Xilinx Spartan-3 version*. John Wiley & Sons, 2011.
- [218] Y.-S. Kung, V. Q. Nguyen, C.-C. Huang, and L.-C. Huang, "Simulink/modelsim co-simulation of sensorless pmsm speed controller," in *2011 IEEE Symposium on Industrial Electronics and Applications*. IEEE, 2011, pp. 24–29.
- [219] S. Jahn, M. Brinson, H. Parruite, B. Arduin, P. Nenzi, and L. Lemaitre, "Gnu simulators supporting verilog-a compact model standardization," in *MOS-AK meeting, Premstaetten*, 2007.
- [220] G. Agakichiev, C. Agodi, H. Alvarez-Pol, E. Atkin, E. Badura, A. Balanda, A. Bassi, R. Bassini, G. Bellia, D. Belver *et al.*, "The high-acceptance dielectron spectrometer hades," *The European Physical Journal A*, vol. 41, no. 2, pp. 243–277, 2009.
- [221] A. E. Fitzgerald, C. Kingsley, S. D. Umans, and B. James, *Electric machinery*. McGraw-Hill New York, 2003, vol. 5.
- [222] T. M. Jacobs, "An object-oriented database implementation of the magic vlsi layout design system," AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OH SCHOOL OF ENGINEERING, Tech. Rep., 1991.
- [223] S. Mahata, A. Maiti, and C. K. Maiti, "Cost-effective web-based electronics laboratory using ni multisim, labview and elvis ii," in *2010 International Conference on Technology for Education*. IEEE, 2010, pp. 242–243.
- [224] M. S. Kamarudin, E. Sulaiman, M. Z. Ahmad, S. A. Zulkifli, and A. F. Othman, "Impulse generator and lightning characteristics simulation using orcad pspice software," 2008.
- [225] T. Kulisic, A. Radonic, V. Katalinic, and M. Milos, "Use of different methods for testing antioxidative activity of oregano essential oil," *Food chemistry*, vol. 85, no. 4, pp. 633–640, 2004.
- [226] P. Nenzi and H. Vogt, "Ngspice users manual version 23," 2011.
- [227] V. Kubov, Y. Dymytrov, and R. Kubova, "Ltpice-model of thermoelectric peltier-seebeck element," in *2016 IEEE 36th International Conference on Electronics and Nanotechnology (ELNANO)*. IEEE, 2016, pp. 47–51.
- [228] I. Kunkel, "Mixed-signal design in chip development," 2015.
- [229] T. Wang, A. V. Karthik, B. Wu, J. Yao, and J. Roychowdhury, "Mapp: the berkeley model and algorithm prototyping platform," in *2015 IEEE Custom Integrated Circuits Conference (CICC)*. IEEE, 2015, pp. 1–8.

- [230] G. L. Beane, "System for producing energy through the action of waves," Apr. 22 2014, uS Patent 8,701,403.
- [231] T. Bybell, "Gtkwave electronic waveform viewer," 2010.
- [232] A. Kay, "Analysis and measurement of intrinsic noise in op amp circuits-part iv: Introduction to spice noise analysis," *EN-Genius Network: analogZONE: a/vZONE*, 2007.
- [233] K. H. Mistry and J. H. Lienhard, "Generalized least energy of separation for desalination and other chemical separation processes," *Entropy*, vol. 15, no. 6, pp. 2046–2080, 2013.
- [234] "Netlistviewer," Feb 2020. [Online]. Available: <https://sourceforge.net/projects/netlistviewer/>
- [235] S. McCartney, *ENIAC: The triumphs and tragedies of the world's first computer*. Walker & Company, 1999.
- [236] A. Vladimirescu, *The SPICE book*. Wiley New York, 1994.
- [237] N. Graf, "Intelligent detector design," *Journal of Instrumentation*, vol. 6, no. 01, p. C01077, 2011.
- [238] K. E. Wage, M. Farrokhrooz, M. A. Dzieciuch, and P. Worcester, "Analysis of the vertical structure of deep ocean noise using measurements from the spicex and philsea experiments," in *Proceedings of Meetings on Acoustics ICA2013*, vol. 19, no. 1. Acoustical Society of America, 2013, p. 070041.
- [239] R. A. Ammar, E. M. Al-Mutiri, and M. A. Abdalla, "The determination of the stability constants of mixed ligand complexes of adenine and amino acids with ni (ii) by potentiometric titration method," *Fluid phase equilibria*, vol. 301, no. 1, pp. 51–55, 2011.
- [240] D. P. Chassin, J. C. Fuller, and N. Djilali, "Gridlab-d: An agent-based simulation framework for smart grids," *Journal of Applied Mathematics*, vol. 2014, 2014.
- [241] T. Brown, J. Hörsch, and D. Schlachtberger, "Pypsa: Python for power system analysis," *arXiv preprint arXiv:1707.09913*, 2017.
- [242] D. Zhang, S. Li, P. Zeng, and C. Zang, "Optimal microgrid control and power-flow study with different bidding policies by using powerworld simulator," *IEEE Transactions on Sustainable Energy*, vol. 5, no. 1, pp. 282–292, 2013.
- [243] A. Sulistio, U. Cibej, S. Venugopal, B. Robic, and R. Buyya, "A toolkit for modelling and simulating data grids: an extension to gridsim," *Concurrency and Computation: Practice and Experience*, vol. 20, no. 13, pp. 1591–1609, 2008.
- [244] R. Brooks, "Pentode for five groups of four instrumentalists (1985)," 1991.
- [245] M. Pöchacker, T. Khatib, and W. Elmenreich, "The microgrid simulation tool rapsim: Description and case study," in *2014 IEEE Innovative Smart Grid Technologies-Asia (ISGT ASIA)*. IEEE, 2014, pp. 278–283.
- [246] M. Mirz, L. Netze, and A. Monti, "A multi-level approach to power system modelica models," in *2016 IEEE 17th workshop on control and modeling for power electronics (COMPEL)*. IEEE, 2016, pp. 1–7.

- [247] P. W. Sauer, M. A. Pai, and J. H. Chow, *Power system dynamics and stability: with synchrophasor measurement and power system toolbox*. John Wiley & Sons, 2017.
- [248] S. Aslam, S. Hannan, U. Sajjad, and W. Zafar, "Implementation of pid on pic24f series microcontroller for speed control of a dc motor using mplab and proteus," *Advances in Science and Technology Research Journal*, vol. 10, no. 31, 2016.
- [249] S. Dutta *et al.*, "Sdcc–small device c compiler," 2012.
- [250] D. Ibrahim, *Designing embedded systems with 32-bit PIC microcontrollers and MikroC*. Newnes, 2013.
- [251] M. NIE, "Department of electronics and communication engineering."
- [252] W. Gay, "Usb," in *Advanced Raspberry Pi*. Springer, 2018, pp. 97–129.
- [253] J. Iovine, *PIC Projects for Non-programmers*. Elsevier, 2011.
- [254] P. G. Savadi and H. Aravind, "Web based telecom tower management using gsm technologies," *International Journal of Systems, Algorithms & Applications*, vol. 2, no. 8, p. 1, 2012.
- [255] A. Nayyar, "An encyclopedia coverage of compiler's, programmer's & simulator's for 8051, pic, avr, arm, arduino embedded technologies," *International Journal of Reconfigurable and Embedded Systems*, vol. 5, no. 1, 2016.
- [256] T. Instruments, "Code composer studio (ccs) integrated development environment (ide)," [línea]. Available: <http://www.ti.com/tool/CCSTUDIO>. [Último acceso: Junio 2015], 2018.
- [257] M. R. Alam, L. N. Groschner, W. Parichatikanond, L. Kuo, A. I. Bondarenko, R. Rost, M. Waldeck-Weiermair, R. Malli, and W. F. Graier, "Mitochondrial ca₂₊ uptake 1 (micu1) and mitochondrial ca₂₊ uniporter (mcu) contribute to metabolism-secretion coupling in clonal pancreatic β -cells," *Journal of Biological Chemistry*, vol. 287, no. 41, pp. 34445–34454, 2012.
- [258] N. Litayem, M. Ghrissi, A. K. B. Salem, and S. B. Saoud, "Designing and building embedded environment for robotic control application," in *2009 35th Annual Conference of IEEE Industrial Electronics*. IEEE, 2009, pp. 2907–2912.
- [259] B. Niu and G. Tan, "Modular control-flow integrity," in *Proceedings of the 35th ACM SIGPLAN Conference on Programming Language Design and Implementation*, 2014, pp. 577–587.
- [260] S. A. Arduino, "Arduino," *Arduino LLC*, 2015.
- [261] J. Noble, *Programming interactivity: a designer's guide to Processing, Arduino, and OpenFrameworks*. "O'Reilly Media, Inc.", 2009.
- [262] A. Reina, "Xcode ide for embedded avr software development," 2007.
- [263] M. I. Tarres Puertas, A. López Riera, P. Palà Schönwälder, and S. Vila Marta, "An interdisciplinary approach to motivate students to learn digital systems and computing engineering," *International journal of engineering education*, vol. 35, no. 2, pp. 510–518, 2019.

-
- [264] R. Mittermayr, *AVR-RISC: Embedded Software selbst entwickeln.* Franzis Verlag, 2009.
 - [265] Y. Zhang, L. Duan, and Y. Xie, "A stable and practical implementation of least-squares reverse time migration," *Geophysics*, vol. 80, no. 1, pp. V23–V31, 2015.
 - [266] D. R. Sitompul and P. Sihombing, "Designing learning media of control based on micro controller 8051 by using the mcu 8051 ide to support the implementation of active learning in higher education-alfhe (active learning for higher education)," *International Journal IJECIERD, ISSN (P)*, 2014.
 - [267] J. D. Carpinelli, "The relatively simple cpu simulator," *age*, vol. 6, p. 1, 2001.
 - [268] C. A. P. Fiorillo and R. M. Ferreira, *Curso de direito da energia.* Editora Saraiva, 2017.
 - [269] V. Herdt, D. Grose, and R. Drechsler, "Fast and accurate performance evaluation for risc-v using virtual prototypes," in *Design, Automation and Test in Europe*, 2020.
 - [270] S. Karandikar, H. Mao, D. Kim, D. Biancolin, A. Amid, D. Lee, N. Pemberton, E. Amaro, C. Schmidt, A. Chopra *et al.*, "Firesim: Fpga-accelerated cycle-exact scale-out system simulation in the public cloud," in *2018 ACM/IEEE 45th Annual International Symposium on Computer Architecture (ISCA)*. IEEE, 2018, pp. 29–42.
 - [271] A. Yousaf and S. Masud, "Stochastic model based dynamic power estimation of microprocessor using imperas simulator," in *2016 Annual IEEE Systems Conference (SysCon)*. IEEE, 2016, pp. 1–8.
 - [272] S. E. Phillips, *First lady.* Hachette UK, 2013.
 - [273] J. H. Rogers, *The giant planet Jupiter.* Cambridge University Press, 1995, vol. 6.
 - [274] J. R. Sangalli, T. H. C. De Bem, F. Perecin, M. R. Chiaratti, L. d. J. Oliveira, R. R. de Araújo, J. R. Valim Pimentel, L. C. Smith, and F. V. Meirelles, "Treatment of nuclear-donor cells or cloned zygotes with chromatin-modifying agents increases histone acetylation but does not improve full-term development of cloned cattle," *Cellular Reprogramming (Formerly Cloning and Stem Cells")*, vol. 14, no. 3, pp. 235–247, 2012.
 - [275] C. Mendelsohn, D. Lohnes, D. Décimo, T. Lufkin, M. LeMeur, P. Champon, and M. Mark, "Function of the retinoic acid receptors (rars) during development (ii). multiple abnormalities at various stages of organogenesis in rar double mutants," *Development*, vol. 120, no. 10, pp. 2749–2771, 1994.
 - [276] J. M. Farrow, Z. M. Sund, M. L. Ellison, D. S. Wade, J. P. Coleman, and E. C. Pesci, "Pqse functions independently of pqsr-pseudomonas quinolone signal and enhances the rhl quorum-sensing system," *Journal of bacteriology*, vol. 190, no. 21, pp. 7043–7051, 2008.
 - [277] P. R. Da Silveira, C. R. da Silva, and R. M. Wentzcovitch, "Metadata management for distributed first principles calculations in vlab—a collaborative cyberinfrastructure for materials computation," *Computer Physics Communications*, vol. 178, no. 3, pp. 186–198, 2008.
 - [278] R. U. Pedersen, J. Nørbjerg, and M. P. Scholz, "Embedded programming education with lego mindstorms nxt using java (lejos), eclipse (xpaintise), and python (pymite)," in *Proceedings of the 2009 Workshop on Embedded Systems Education*, 2009, pp. 50–55.
-

- [279] G. Mars, *Cheats at work: An anthropology of workplace crime*. Routledge, 2019.
- [280] C. Santos, J. Spim, and A. Garcia, "Mathematical modeling and optimization strategies (genetic algorithm and knowledge base) applied to the continuous casting of steel," *Engineering applications of artificial intelligence*, vol. 16, no. 5-6, pp. 511–527, 2003.
- [281] M. J. Swan, "Using spanning tree protocol (stp) to enhance layer-2 network topology maps," Oct. 25 2011, uS Patent 8,045,488.
- [282] A. Khaire and P. B. Mali, "A web based approach towards the automated generation of er-diagram."
- [283] J. Janitor, F. Jakab, and K. Kniewald, "Visual learning tools for teaching/learning computer networks: Cisco networking academy and packet tracer," in *2010 Sixth International Conference on Networking and Services*. IEEE, 2010, pp. 351–355.
- [284] C. Welsh, *GNS3 network simulation guide*. Packt Publ., 2013.
- [285] L. Chappell, *Wireshark network analysis*. PODBOOKS. COM, LLC, 2012.
- [286] G. Anuzelli, N. Files, P. Emulation, M. U. Optimizations, and H. C. Emulated, "Dynamips/dynagen tutorial," *Online:* <http://dynagen.org/tutorial.htm>, 2011.
- [287] P. Goyal and A. Goyal, "Comparative study of two most popular packet sniffing tools-tcpdump and wireshark," in *2017 9th International Conference on Computational Intelligence and Communication Networks (CICN)*. IEEE, 2017, pp. 77–81.
- [288] W. Xing, Y. Zhao, and T. Li, "Research on the defense against arp spoofing attacks based on winpcap," in *2010 Second International Workshop on Education Technology and Computer Science*, vol. 1. IEEE, 2010, pp. 762–765.
- [289] M. G. Nagaraja, R. R. Chittal, and K. Kumar, "Study of network performance monitoring tools-snmp," *IJCSNS*, vol. 7, no. 7, pp. 310–314, 2007.
- [290] A. Paessler, "Prtg network monitor," 2009.
- [291] S. M. Fikke, G. Ronsten, A. Heimo, S. Kunz, M. Ostrozlik, P. Persson, J. Sabata, B. Wareing, B. Wichura, J. Chum *et al.*, *COST 727: atmospheric icing on structures: measurements and data collection on icing: state of the art*. Meteo Schweiz, 2006.
- [292] N. Enterprises, "Nagios," 2017.
- [293] D. Schoen, *Getting Started with Spiceworks*. Packt Publishing Ltd, 2013.
- [294] M. Badger, *Zenoss Core 3.x Network and System Monitoring*. Packt Publishing Ltd, 2011.
- [295] R. Olups, *Zabbix 1.8 network monitoring*. Packt Publishing Ltd, 2010.
- [296] B. Allen, T. Drysdale, S. Zhang, D. Isakov, A. Tenant, W. Whittow, C. Stevens, J. Vardaxoglou, and J. Coon, "Reduction of orbital angular momentum radio beam divergence using a 3d printed planar graded index lenses," in *12th European Conference on Antennas and Propagation (EuCAP 2018)*. IET, 2018, pp. 1–3.

- [297] G. Gampala and C. Reddy, "Design of millimeter wave antenna arrays for 5g cellular applications using feko," in *2016 IEEE/ACES International Conference on Wireless Information Technology and Systems (ICWITS) and Applied Computational Electromagnetics (ACES)*. IEEE, 2016, pp. 1–2.
- [298] I. S. Shahdan, R. Mardeni, and K. S. Subari, "Simulation of frequency modulated continuous wave ground penetrating radar using advanced design system (ads)," in *2010 IEEE Asia-Pacific Conference on Applied Electromagnetics (APACE)*. IEEE, 2010, pp. 1–5.
- [299] C. Warren, A. Giannopoulos, and I. Giannakis, "gprmax: Open source software to simulate electromagnetic wave propagation for ground penetrating radar," *Computer Physics Communications*, vol. 209, pp. 163–170, 2016.
- [300] P. Chen and H. Chen, "Angora: Efficient fuzzing by principled search," in *2018 IEEE Symposium on Security and Privacy (SP)*. IEEE, 2018, pp. 711–725.
- [301] C. Su, H. Ke, and T. Hubing, "Overview of electromagnetic modeling software," in *Proc. of the 25th International Review of Progress in Applied Computational Electromagnetics*, 2009, pp. 736–741.
- [302] J. Yanamadala, G. M. Noetscher, V. K. Rathi, S. Maliye, H. A. Win, A. L. Tran, X. J. Jackson, A. T. Htet, M. Kozlov, A. Nazarian *et al.*, "New vhp-female v. 2.0 full-body computational phantom and its performance metrics using fem simulator ansys hfss," in *2015 37th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)*. IEEE, 2015, pp. 3237–3241.
- [303] D. R. Aloori and S. Ramagiri, "Simulation of near-field generated by s-band rectangular horn antenna array for hyperthermia therapy applications using 4nec2 software," 2010.
- [304] J. Dietrich and A. Sebak, "Automating nec2 with matlab/sup/spl reg//for antenna analysis and design," in *IEEE CCECE2002. Canadian Conference on Electrical and Computer Engineering. Conference Proceedings (Cat. No. 02CH37373)*, vol. 1. IEEE, 2002, pp. 342–346.
- [305] M. Mahardika, G. Nugroho, and E. Y. Prasetyo, "Uav long range surveillance system based on biquad antenna for the ground control station," in *2016 IEEE Student Conference on Research and Development (SCOReD)*. IEEE, 2016, pp. 1–5.
- [306] O. O. Olaode, W. D. Palmer, and W. T. Joines, "Effects of meandering on dipole antenna resonant frequency," *IEEE Antennas and Wireless Propagation Letters*, vol. 11, pp. 122–125, 2012.
- [307] A. F. Oskooi, D. Roundy, M. Ibanescu, P. Bermel, J. D. Joannopoulos, and S. G. Johnson, "Meep: A flexible free-software package for electromagnetic simulations by the fdtd method," *Computer Physics Communications*, vol. 181, no. 3, pp. 687–702, 2010.
- [308] T. Liebig, A. Rennings, S. Held, and D. Erni, "openems—a free and open source equivalent-circuit (ec) fdtd simulation platform supporting cylindrical coordinates suitable for the analysis of traveling wave mri applications," *International Journal of Numerical Modelling: Electronic Networks, Devices and Fields*, vol. 26, no. 6, pp. 680–696, 2013.

- [309] A. Bermúdez, D. Gómez, and P. Salgado, "Eddy currents with maxfem," in *Mathematical Models and Numerical Simulation in Electromagnetism*. Springer, 2014, pp. 325–345.
- [310] D. Meeker, "Finite element method magnetics," *FEMM*, vol. 4, p. 32, 2010.
- [311] K. Berry, "The tex live guide," 2012.
- [312] B. van der Zander, J. Sundermeyer, D. Braun, and T. Hoffmann, "Texstudio: Latex made comfortable, *texstudio*," *Consulté le*, vol. 18, 2017.
- [313] Z. Y. Lee, "Overleaf to texmaker bibtex template," 2016.
- [314] C. Schwesig, I. Poupyrev, and E. Mori, "Gummi: a bendable computer," in *Proceedings of the SIGCHI conference on Human factors in computing systems*, 2004, pp. 263–270.
- [315] M. Liao, Y. Tzeng, L. Y. Chang, H. Huang, T. Lin, C. Chyan, and Y.-C. Chen, "The correlation between neurotoxicity, aggregative ability and secondary structure studied by sequence truncated $\alpha\beta$ peptides," *FEBS letters*, vol. 581, no. 6, pp. 1161–1165, 2007.
- [316] J. van der Hoeven, "Gnu texmacs," *ACM SIGSAM Bulletin*, vol. 38, no. 1, pp. 24–25, 2004.
- [317] K. E. Casey, C. M. Dewees, B. R. Turris, and J. E. Wilen, "The effects of individual vessel quotas in the british columbia halibut fishery," *Marine Resource Economics*, vol. 10, no. 3, pp. 211–230, 1995.
- [318] N. Mazziotta, "Building the syntactic reference corpus of medieval french using notabene rdf annotation tool," in *Proceedings of the Fourth Linguistic Annotation Workshop*. Association for Computational Linguistics, 2010, pp. 142–146.
- [319] B. Camarda, *Special Edition Using Microsoft Office Word 2003*. Que Publishing, 2004.
- [320] C. Strobbe, B. Frees, and J. Engelen, "An accessibility checker for libreoffice and openoffice. org writer," in *International Conference on Computers for Handicapped Persons*. Springer, 2012, pp. 484–491.
- [321] S. GROUP *et al.*, *WPS Office+ PDF*, 2015.
- [322] D. Lachowicz and H. Figuière, "Abiword," 2010.
- [323] H. Melville, *Bartleby, the scrivener: a story of Wall Street*. ReadHowYouWant. com, 2006.
- [324] R. Petersen, "Office applications, email, editors, and databases," in *Beginning Fedora Desktop*. Springer, 2018, pp. 171–210.
- [325] G. Shmueli, N. R. Patel, and P. C. Bruce, *Data mining for business intelligence: Concepts, techniques, and applications in Microsoft Office Excel with XLMiner*. John Wiley and Sons, 2011.
- [326] R. Pfister, K. Schwarz, R. Carson, and M. Jancyzk, "Easy methods for extracting individual regression slopes: Comparing spss, r, and excel," *Tutorials in Quantitative Methods for Psychology*, vol. 9, no. 2, pp. 72–78, 2013.
- [327] J. Sikora, J. Sroka, and J. Tyszkiewicz, "Programming communication with the user in multiplatform spreadsheet applications," in *Federation of International Conferences on Software Technologies: Applications and Foundations*. Springer, 2016, pp. 356–371.

- [328] B. McCullough, "Fixing statistical errors in spreadsheet software: the cases of gnumeric and excel," *Computational Statistics & Data Analysis Statistical Software Newsletter*, pp. 1–10, 2004.
- [329] A. Clark and J. L. Hellerstein, "Scisheets: Providing the power of programming with the simplicity of spreadsheets," in *Proceedings of the 16th Python in Science Conference (SciPy 2017)*. SciPy.org, 2017.
- [330] N. Vernadakis, P. Antoniou, M. Giannousi, E. Zetou, and E. Kioumourtzoglou, "Comparing hybrid learning with traditional approaches on learning the microsoft office power point 2003 program in tertiary education," *Computers & Education*, vol. 56, no. 1, pp. 188–199, 2011.
- [331] S. Oualline and G. Oualline, "Creating presentations with libreoffice impress," in *Practical Free Alternatives to Commercial Software*. Springer, 2018, pp. 119–138.
- [332] V. Olteanu, A. Agache, A. Voinescu, and C. Raiciu, "Stateless datacenter load-balancing with beamer," in *15th {USENIX} Symposium on Networked Systems Design and Implementation ({NSDI} 18)*, 2018, pp. 125–139.
- [333] J. C. Whyte and R. Bull, "Number games, magnitude representation, and basic number skills in preschoolers." *Developmental psychology*, vol. 44, no. 2, p. 588, 2008.
- [334] S. Holzner, *Special edition using microsoft® office visio® 2007*. Que Corp., 2007.
- [335] M. Fox, J. Cleland *et al.*, "Libre office 4.3 libreoffice documentation team draw guide working with vector graphics," 2015.
- [336] C.-C. Tsou, D. Avtonomov, B. Larsen, M. Tucholska, H. Choi, A.-C. Gingras, and A. I. Nesvizhskii, "Dia-umpire: comprehensive computational framework for data-independent acquisition proteomics," *Nature methods*, vol. 12, no. 3, p. 258, 2015.
- [337] Y. Chen and Y. Avnimelech, *The role of organic matter in modern agriculture*. Springer Science & Business Media, 2012, vol. 25.
- [338] S. Aschwanden-Granfelt, "Process flow documentation: A flowchart guide for micro & small business," 2017.
- [339] K. M. Ahmed and B. Al Dhubaib, "Zotero: A bibliographic assistant to researcher," *Journal of Pharmacology and Pharmacotherapeutics*, vol. 2, no. 4, p. 303, 2011.
- [340] S. Feyer, S. Siebert, B. Gipp, A. Aizawa, and J. Beel, "Integration of the scientific recommender system mr. dlib into the reference manager jabref," in *European Conference on Information Retrieval*. Springer, 2017, pp. 770–774.
- [341] J. Arroyo-Hernández and M. F. Viguez-Ortiz, "Referencias bibliográficas con latex usando software librever," 2017.
- [342] M. McCracken, A. Maxwell, and C. Hofman, "Bibdesk," 2015.
- [343] H. Kawashima and K. Gondow, "Experience with ansi c markup language for a cross-referencer," in *36th Annual Hawaii International Conference on System Sciences, 2003. Proceedings of the*. IEEE, 2003, pp. 10–pp.

- [344] H. Dvinge, A. Git, S. Gräf, M. Salmon-Divon, C. Curtis, A. Sottoriva, Y. Zhao, M. Hirst, J. Armisen, E. A. Miska *et al.*, "The shaping and functional consequences of the microRNA landscape in breast cancer," *Nature*, vol. 497, no. 7449, pp. 378–382, 2013.
- [345] M. Tsitoara, "Git gui tools," in *Beginning Git and GitHub*. Springer, 2020, pp. 219–237.
- [346] A. Kees and D. R. Markowski, "Marktübersicht os projektmanagement-software," in *Open Source Enterprise Software*. Springer, 2019, pp. 333–398.
- [347] A. Mishra and D. Mishra, "Software project management tools: a brief comparative view," *ACM SIGSOFT Software Engineering Notes*, vol. 38, no. 3, pp. 1–4, 2013.
- [348] Y. Zhang, N. Beheshti, L. Beliveau, G. Lefebvre, R. Manghirmalani, R. Mishra, R. Patneyt, M. Shirazipour, R. Subrahmaniam, C. Truchan *et al.*, "Steering: A software-defined networking for inline service chaining," in *2013 21st IEEE international conference on network protocols (ICNP)*. IEEE, 2013, pp. 1–10.
- [349] S. Zurborg, B. Yurgionas, J. A. Jira, O. Caspani, and P. A. Heppenstall, "Direct activation of the ion channel trpA1 by ca 2+," *Nature neuroscience*, vol. 10, no. 3, pp. 277–279, 2007.
- [350] M. A. Redaelli, S. Lindner, and S. Erhardt, "Circuitikz," URL <http://www.ctan.org/tex-archive/help/Catalogue/entries/circuitikz.html>. Probablement installé dans votre système sous le nom circuitikzmanual.pdf, vol. 17, 2017.
- [351] W. Liu and S.-I. Liu, "Cmos tunable 1/x circuit and its applications," *IEICE TRANSACTIONS on Fundamentals of Electronics, Communications and Computer Sciences*, vol. 86, no. 7, pp. 1896–1899, 2003.
- [352] A. V. Romero, *VirtualBox 3.1: Beginner's Guide*. Packt Publishing Ltd, 2010.
- [353] V. Infrastructure, "Resource management with vmware drs," *VMware Whitepaper*, vol. 13, 2006.
- [354] M. Dowty and J. Sugerman, "Gpu virtualization on vmware's hosted i/o architecture," *ACM SIGOPS Operating Systems Review*, vol. 43, no. 3, pp. 73–82, 2009.
- [355] D. Bartholomew, "Qemu: a multihost, multitarget emulator," *Linux Journal*, vol. 2006, no. 145, p. 3, 2006.
- [356] J. W. Allen, "The dish antenna at the table mountain i1Oc site," 2018.
- [357] B. Pfeil, A. Olsen, D. C. Bakker, S. Hankin, H. Koyuk, A. Kozyr, J. Malczyk, A. Manke, N. Metzl, C. L. Sabine *et al.*, "A uniform, quality controlled surface ocean co₂ atlas (socat)," *Earth system science data Discussions*, vol. 5, no. 2, pp. 735–780, 2012.
- [358] D. Hilliker, "Newest utf-8 teraterm pro 4.45-accessible, free serial, ssh and telnet terminal emulator," *Blind Access Journal*, 2006.
- [359] A. Atkeson and P. J. Kehoe, "Models of energy use: Putty-putty versus putty-clay," *American Economic Review*, vol. 89, no. 4, pp. 1028–1043, 1999.
- [360] R. Pant and B. Eggleton, "Chalcogenide glass waveguide devices for all-optical signal processing," in *Chalcogenide Glasses*. Elsevier, 2014, pp. 438–470.

- [361] P. Wessel, W. H. Smith, R. Scharroo, J. Luis, and F. Wobbe, "Generic mapping tools: improved version released," *Eos, Transactions American Geophysical Union*, vol. 94, no. 45, pp. 409–410, 2013.
- [362] A. T. Yalta and R. Lucchetti, "The gnu/linux platform and freedom respecting software for economists," *Journal of Applied Econometrics*, vol. 23, no. 2, pp. 279–286, 2008.
- [363] B. Rosenfeld, "A cross-platform programmer's calculator."
- [364] "Convert." [Online]. Available: <http://unihedron.com/projects/convert/>
- [365] "Convertall." [Online]. Available: <https://sourceforge.net/projects/convertall/>
- [366] "Multiconvert." [Online]. Available: <https://www.kreativekorp.com/software/mcii/>
- [367] A. Pedretti, L. Villa, and G. Vistoli, "Vega: a versatile program to convert, handle and visualize molecular structure on windows-based pcs," *Journal of Molecular Graphics and Modelling*, vol. 21, no. 1, pp. 47–49, 2002.
- [368] L. Books, "Dictionary software: Babylon, ultralingua, powerword, dictionary, lingoes, goldendict, wordweb, lingvo, ifinger, omnidictionary," 2010.
- [369] J. Ganeri, *Artha: Meaning*. Oxford University Press, 2013.
- [370] H. L. Bhadrecha and P. K. Sharma, "Advance resistor value calculator with matlab," *IJEC5*, vol. 4, no. 1, 2015.