
annual OPEN SOURCE magazine of NITDGP
LINIT

FROM THE DIRECTOR'S DESK

With the advent and the regular advances in the field of software and technology in nearly all walks of our lives, a layman's life has surely become easy and enjoyable with the happiness quotient touching new highs.

Spearheading the FOSS curriculum in the NIT Durgapur premises is the GNU Linux Users' Group that saw its commencement eight years back, presently working as a full-fledged association of over 200 members . It gives me immense delight to note that the group is bringing forth the fourth edition of its annual periodical - LINIT.

Being a user of FOSS myself for quite some time, one thing that strikes me instantaneously about the same is the freedom it provides any person or organization without having to deal with the developer. Further more, granting the ease of liberty to individuals to cooperate in enhancing and refining the programs they use , it comes across as a commercially viable product too.

To walk in step with the fast paced world and to be in sync with the happenings all over the globe. I believe that embracing and incorporating novel ideas in our respective workplaces and homes is the easiest way out. I am glad to learn that GLUG, NIT Durgapur is trying every bit to bring home the same.

My Best wishes to all.

Prof. T. Kumar,
Director,
NIT Durgapur

INTERVIEW
SUBRATA NANDI
FACULTY ADVISOR

GNU | LINUX
USERS' GROUP

Q. What role did FOSS play in education in the yesteryears and how in your opinion has that evolved over the years?

A. FOSS fosters education. Over the years, Free and Open Source Softwares have played an increasingly influential role in imparting education. The open philosophy of FOSS is consistent with academic freedom and the open dissemination of knowledge and information common in academia.
For studies in the field of computer science, the use of FOSS has increased manifold. During our days of study, the use of FOSS in undergraduate computer science courses was limited to the GCC (The GNU Compiler Collection) and GDB (The GNU Debugger). The use of FOSS in other areas of study was extremely limited. However, today we have a whole new gamut of IDEs, Open Source programming languages and platforms, simulators and modeling tools to aid studies across all disciplines.
It is really encouraging to see FOSS gaining ground in elementary education. Free and Open Source Softwares have now been adopted by schools around the globe not only because of lower costs but also for their reliability, performance and security, possibility of localization and most importantly, to learn from

Q. Do you feel that FOSS should be a part of our academic curriculum?

A. Indian curriculum has been traditionally rigid with students often lacking the freedom to choose courses according to their interests. Effecting change in the curriculum is a long-drawn process. Therefore, it is the teaching community which should act as the stimulant for change. Academia should be capable of judging contributions to open source and thereafter, academic incentives to contribute to FOSS would be a tremendous boost not only for the open source community but also for the students to pick up potential skills that can set them apart once they join the industry.
Learning is fostered more by doing, teaching and collaborating. Foss is based on all three of these, which is why Foss makes sense as a part of the academic curriculum. Teachers need to be prepared to sit down and figure out a problem and its solution along with the student, and not by themselves, only to proclaim the solution hours later. It's the process of figuring it out that creates learning, not the process of listening to a clean room solution.

Q. Your opinion on the work that GLUG is presently doing and what remains to be done to take the movement forward.

A. GLUG, NIT Durgapur has made excellent strides in promoting and advocating the use of Free and Open Source Softwares in the campus.
The work by its members towards facilitating a shift to the use of GNU/Linux and other open source softwares in the departments and computer centre is commendable to say the least.
However, funds have always been a hindrance to our aim of putting together a larger, more proactive community. Our journey so far has been far from easy with fundraising being the most pertinent challenge. The events and activities undertaken by the group are unique in their own way and are conducted to realise a greater cause – Software Freedom. It is therefore my humble opinion that the industry should lend us a helping hand by extending greater support.

Q. How effective is Linit as a publication dedicated to keeping its readers updated with the latest in the FOSS world?

A. Linit has been very effective in keeping all of us in sync with the happenings in the world of Free and Open Source Software. It has proved to be an irreplaceable source of information for many of us and will definitely continue to keep its readers updated with the latest trends in open source. However, with the changing times, it has now become imperative to make a shift towards a continuous mode of publication, over electronic media. In the near future, I see Linit not only as an annual publication on print but also as a forum of interactive discussions, with a wide reach through electronic media, making the use of funds most optimal.

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AS TOLD TO
PROMIT BISWAS

FORM THE EDITOR'S DESK

LINIT, a magazine brought forth by the members of GNU/LINUX USERS' GROUP, NIT DURGAPUR, aims at reaching out to the masses and initiating a thought process within them about the role of FOSS in the society. It helps them develop and contribute, two of the major instruments for building a better society.

This is a magazine that needs no introduction. For years, it has been striving towards its goal of introducing people to the world of FOSS and Linux, and helping them reach a point from where they can learn on their own.

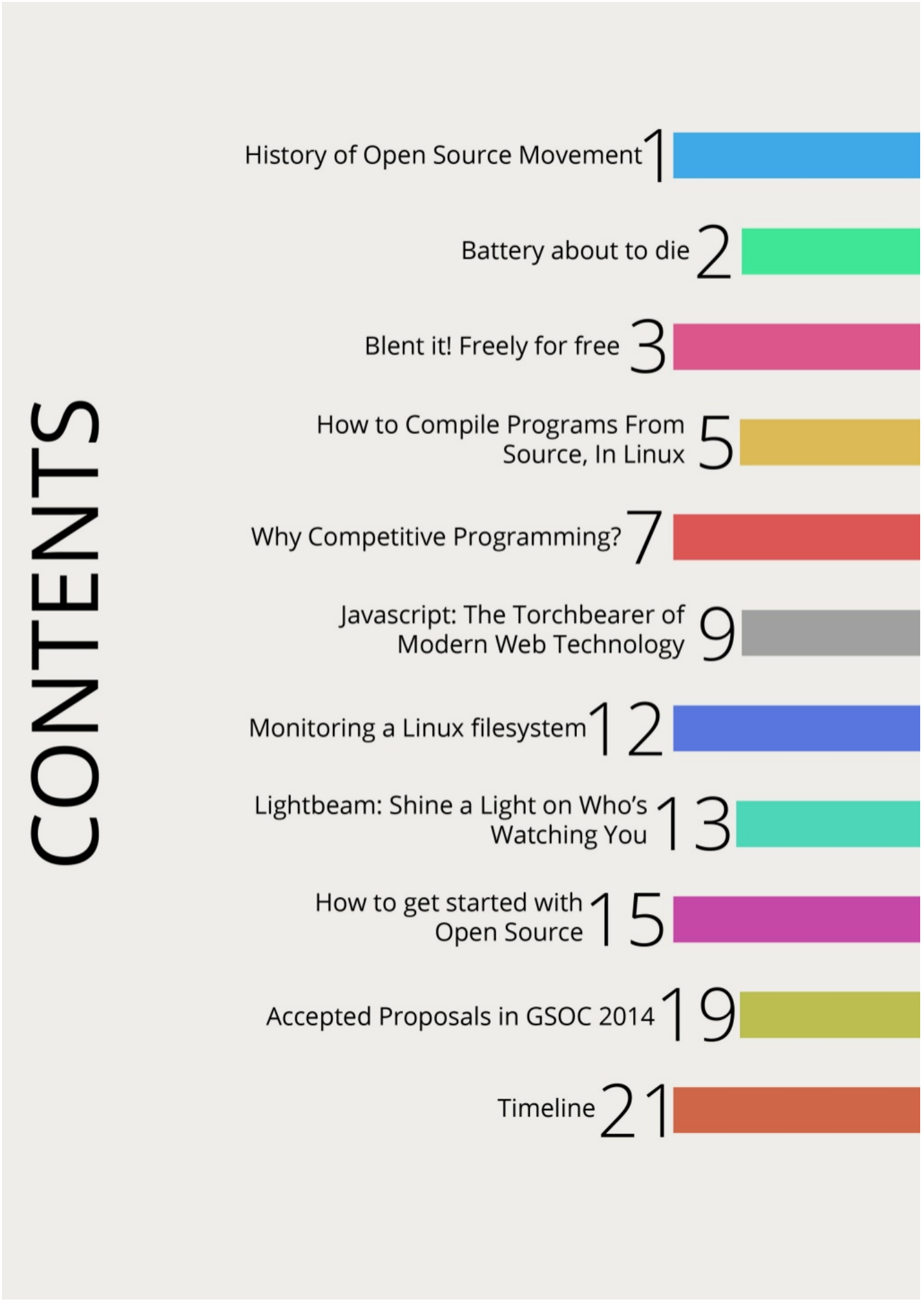
We present this year's edition of LINIT, where we have shifted our focus slightly from answering questions like 'What is FOSS and why should I use it?' to getting familiarised with the nitty-gritty of what FOSS is like and how one can enjoy it's world all the while, learning from it!

If you are a person who is related to the computing fields, read on. If you are a person related with other fields, definitely go through it! Who knows, something might excite you to get into this interesting world and be a part of it!

I thank the people who took their time out to contribute amazing articles to this magazine and making it what it is today. Your knowledge is a source of inspiration for many!

I hope you find it amazing, instructive and fun!

Arijit Karmakar
Editor-in-Chief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BY RUPANJANA MITRA
4TH YEAR, CSE
NIT DURGAPUR

HISTORY OF OPEN SOURCE MOVEMENT

If you are in Kde, you would know there is a multiline comment in the beginning of every source code class where you would come across a phrase GNU General Public License. This generally speaks about the license that was initiated by Richard Stallman in around 1970 such that no organization or a group of developers can seek for propriety rights.

There is no difference in coding methodologies in open source and traditional propriety softwares. The difference lies in the kind of restrictions imposed on users using the software. Users have rights on both the code and the end product in case of open source software, whereas in traditional software, users can only get the functionality. 'A' makes software under the label 'open source'. He has to share it with other people. He cannot say, *"Oh! I have spent nights on that code, please don't touch it."* An **X, Y, Z** can edit and reedit the code. But then I go and change the code, and suddenly word processing software starts playing music; that does not happen. You change the code in your local machine; you show it to people (working in that particular software) around the world, convince them that your change adds value to the software, does not crash and does not convert it into an altogether new entity. Then consequently, your code gets merged to the remote copy of the software. All the other developers get the updated version of the code once the merge is completed.

It is really difficult to pinpoint an individual who has done the real meaty work; hence the spirit of the very movement is kept with. Stallman was actually building an OS in the 1980s which was named GNU. Linus Torvalds (with whom my GSOC mentor has a picture, yeah of course a proud moment for me :P) then on top of GNU produced what we use now, LINUX.

Slowly, with a dense group of open source developers, Linux got strengthened. We all have heard, read, came across or atleast ignored the term ***"Open Source Initiative"*** quite a number of times. This organization actually made things official. Founded by Eric Raymond and Bruce Perens in 1998, this organization defined the Open Source Definition based on Debian Free Software Guidelines. The movement is neither doing something very innovative nor something new from what traditional software companies do. It is actually enabling inexpert users (like me :P) to be a part of the code base. We have open source software all around. Mozilla Firefox, Android, Google Chromium are just few examples. With all the good things, there are some real problems with open source. It is human nature to work when there is some constraint on the individual. I was reading somewhere, too much freedom is limiting. Okay, with all these philosophies, I wanted to say that there are many open source projects which go unfinished. Nobody has the onus to complete them. Sometimes with too many people contributing, a particular code may face problems in compatibility and even in standards. Wikipedia, which is helping me write this article, is an open source development. Google advocates open source in numerous ways. I will restrict myself to the allies of open source for the time being.

There are open access movements, enabling access to academic material to enhance research, free culture movement (which everybody of us yearn for in India :P) seeking freedom of knowledge, expression and creativity and Creative Commons whose spirit can be held at par with open source movement.

Resource courtesy: *Wikipedia, I just made the entire thing more readable :D.*

BY ARCHITA SURAI
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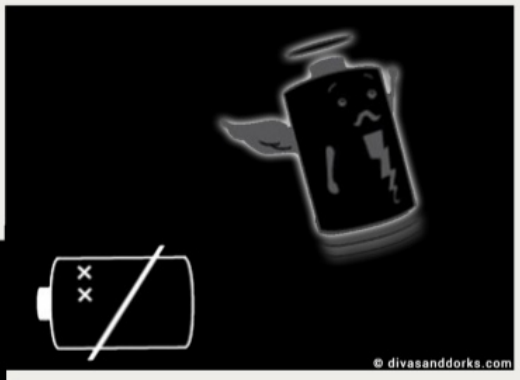
GNU|LINUX USERS' GROUP

BATTERY ABOUT TO DIE

One of the most common problems with laptops today is battery backup. Searching for a suitable place to charge every now and then is really cumbersome and at times irritating. This problem of low battery life is mainly caused due to unnecesarry applications running in background. Screen brightness and also the use of some specific hardware devices affect battery life. So automatically a question pops up "How to increase battery backup?"



Linux distros come with a handful of solutions to this problem. Of course one of the crude level solution is to reduce the screen brightness to min. However there are other solutions too.

One is "laptop-mode-tools". This is a package that can be used to extend battery life by enabling the laptop mode feature of the linux kernel. This package internally slows down the speed of the hard drive spin in addition to applying power saving settings to various hardware devices such as bluetooth, USB ports etc.

A simple way to install this package **(Ubuntu 14.04 and onwards)** is to type in the command in the terminal:

sudo apt-get install laptop-mode-tools

For older versions of Ubuntu the set of commands are a bit different:

sudo add-apt-repository ppa:webupd8team/ unstable

sudo apt-get update

This tool starts automatically. If it does not get started for some reason then it can be done manually by editing the main configuration file. What needs to be done is just to open the main configuration file in any editor and search for the following line:
ENABLE_LAPTOP_MODE_TOOLS=0
Change the value from zero to one. This will enable the laptop mode tool.

A checkpoint to be mentioned here is that the linux distro should not have a tool known as TLP installed. These two tools are conflicting with each other. Battery backup can also be enhanced by another tool known as TLP. As mentioned above this tool is conflicting with laptop-mode-tools. So before installing this just check if the distro has got laptop-mode-tools installed. For doing this type in the command in your terminal :

dpkg -l laptop-mode-tools

TLP will start automatically on startup but for the first time it can be done manually by the following command (in case a re-start is preferably avoided)

sudo tlp start

These are a few tools that help in managing battery life. However there are also some tools that help to track the background programs that unnecessarily consuming power. One such tool is Powertop. It helps to know the processes that consume power the most. Before concluding one point that is worth mentioning here is to avoid overheating of the laptop since it causes battery to run out earlier than usual.

Plugging in laptops while working can affect the battery life in a negative way in the long run. Other measures that can be taken are like switching off Bluetooth, USB devices, Wi-Fi when not in use. Battery once fully charged should not be left dormant for a long period of time. Charging and discharging at regular intervals helps in maintaining a long battery life.

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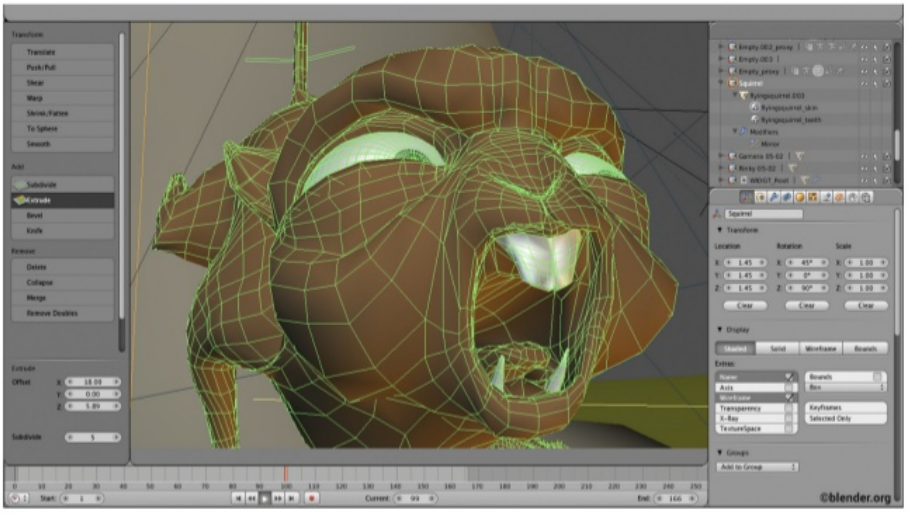
BY SHASWAT GUPTA
2ND YEAR, IT
NIT DURGAPUR



BLENT IT!

FREELY FOR FREE

THE ORGANIZATION

Blender Foundation is a Dutch public benefit corporation established to support and facilitates the projects on *blender.org*.

THE SOFTWARE

Blender is a free and open source 3D animation suite. It supports the entirety of the 3D pipeline—modeling, rigging, animation, simulation, rendering, compositing and motion tracking, even video editing and game creation. Advanced users employ Blender's API for Python scripting to customize the application and write specialized tools; often these are included in Blender's future releases. Blender is well suited to individuals and small studios who benefit from its unified pipeline and responsive development process. Examples from many Blender-based projects are available below.

"We want to build a free and open source complete 3D creation pipeline for artists and small teams."

VIDEO EDITING

Blender even comes with a built-in Video Editor.
The Video Editor allows you to perform basic actions like video cuts and splicing, as well as more complex tasks like video masking.

The Video Editor includes:
Live preview, luma waveform, Chroma vectorscope and histogram displays

Audio mixing, syncing, scrubbing and waveform visualization

Up to 32 slots for adding video, images, audio, scenes, masks and effects

Speed control, adjustment layers, transitions, keyframes, filters and more.

LIBRARY OF EXTENSIONS

With a large community of enthusiasts and developers, Blender comes loaded with a vast array of extensions that you can turn on or off easily.

Some existing extensions include:
Generators for trees, terrain, ivy and clouds.

Fracture Objects.

3D Printing Toolbox.

Rigify meta-rigging system.

Import and Export format support for AfterEffects, DirectX, Unreal Game Engine and more!

GAME CREATION

Included in Blender is a complete game engine, allowing you to create a fully featured 3d game right inside Blender.

The game engine includes:
Ability to port your models to any third-party game engine

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