
Data Digitizer Documentation

Release 1.1.0

M. Skocic

Nov 08, 2021

CONTENTS

1	Getting started	1
2	User Guide	15
3	Release Notes	25
4	Autogenerated Documentation	29
5	Indices and tables	37
	Python Module Index	39
	Index	41

GETTING STARTED

1.1 Description

DataDigitizer is a simple graphical tool for digitizing data from images.

In terminal enter the following command:

```
python -m datadigitizer
```

The cursor is used to point a specific position in the graph whereas all operations are done through keyboard combinations or through the main menu.

Legend:

- Red crosses are data points
- Blue crosses are Xmin and Xmax
- Green crosses are Ymin and Ymax

Commands:

- <Ctrl-o> for loading image.
- <Ctrl-a> add data point.
- <Hold a+Left Click> add data point.
- <Left Click> select a data point.
- <Hold Ctrl+Left Click> multiple data point selection.
- <Ctrl-g> set Xmin from last data point or from selected data point.
- <Ctrl-h> set Xmax from last data point or from selected data point.
- <Ctrl-j> set Ymin from last data point or from selected data point.
- <Ctrl-k> set Ymax from last data point or from selected data point
- <Ctrl-l> set all limits from last 4 data points or from last 4 selected data points.
- <Ctrl-n> remove all limits.
- <Ctrl-z> remove last data point.
- <Ctrl-d> remove selected data point.
- <Ctrl-D> remove all data points.
- <Ctrl-m> compute the data points.
- <Ctrl-t> view data table.
- <Ctrl-s> save data points.
- <Ctrl-w> clear all.

A pdf version of the documentation can be found here [DataDigitizer](#). The source code can be viewed on [GitHub](#).

1.2 How to install

```
$ python setup.py install  
  
or  
  
$ pip install datadigitizer
```

1.3 Dependencies

```
numpy>=1.17  
matplotlib>=3.0.0  
Pillow>=6.0.0
```

1.4 License

GNU GENERAL PUBLIC LICENSE Version 3, 29 June 2007

Copyright (C) 2007 Free Software Foundation, Inc. <<https://fsf.org/>>
Everyone is permitted to copy and distribute verbatim copies
of this license document, but changing it is not allowed.

Preamble

The GNU General Public License is a free, copyleft license for
software and other kinds of works.

The licenses for most software and other practical works are designed
to take away your freedom to share and change the works. By contrast,
the GNU General Public License is intended to guarantee your freedom to
share and change all versions of a program--to make sure it remains free
software for all its users. We, the Free Software Foundation, use the
GNU General Public License for most of our software; it applies also to
any other work released this way by its authors. You can apply it to
your programs, too.

When we speak of free software, we are referring to freedom, not
price. Our General Public Licenses are designed to make sure that you
have the freedom to distribute copies of free software (and charge for
them if you wish), that you receive source code or can get it if you
want it, that you can change the software or use pieces of it in new
free programs, and that you know you can do these things.

To protect your rights, we need to prevent others from denying you
these rights or asking you to surrender the rights. Therefore, you have
certain responsibilities if you distribute copies of the software, or if
you modify it: responsibilities to respect the freedom of others.

(continues on next page)

(continued from previous page)

For example, if you distribute copies of such a program, whether gratis or for a fee, you must pass on to the recipients the same freedoms that you received. You must make sure that they, too, receive or can get the source code. And you must show them these terms so they know their rights.

Developers that use the GNU GPL protect your rights with two steps: (1) assert copyright on the software, and (2) offer you this License giving you legal permission to copy, distribute and/or modify it.

For the developers' and authors' protection, the GPL clearly explains that there is no warranty for this free software. For both users' and authors' sake, the GPL requires that modified versions be marked as changed, so that their problems will not be attributed erroneously to authors of previous versions.

Some devices are designed to deny users access to install or run modified versions of the software inside them, although the manufacturer can do so. This is fundamentally incompatible with the aim of protecting users' freedom to change the software. The systematic pattern of such abuse occurs in the area of products for individuals to use, which is precisely where it is most unacceptable. Therefore, we have designed this version of the GPL to prohibit the practice for those products. If such problems arise substantially in other domains, we stand ready to extend this provision to those domains in future versions of the GPL, as needed to protect the freedom of users.

Finally, every program is threatened constantly by software patents. States should not allow patents to restrict development and use of software on general-purpose computers, but in those that do, we wish to avoid the special danger that patents applied to a free program could make it effectively proprietary. To prevent this, the GPL assures that patents cannot be used to render the program non-free.

The precise terms and conditions for copying, distribution and modification follow.

TERMS AND CONDITIONS

0. Definitions.

"This License" refers to version 3 of the GNU General Public License.

"Copyright" also means copyright-like laws that apply to other kinds of works, such as semiconductor masks.

"The Program" refers to any copyrightable work licensed under this License. Each licensee is addressed as "you". "Licensees" and "recipients" may be individuals or organizations.

To "modify" a work means to copy from or adapt all or part of the work in a fashion requiring copyright permission, other than the making of an exact copy. The resulting work is called a "modified version" of the earlier work or a work "based on" the earlier work.

A "covered work" means either the unmodified Program or a work based

(continues on next page)

(continued from previous page)

on the Program.

To "propagate" a work means to do anything with it that, without permission, would make you directly or secondarily liable for infringement under applicable copyright law, except executing it on a computer or modifying a private copy. Propagation includes copying, distribution (with or without modification), making available to the public, and in some countries other activities as well.

To "convey" a work means any kind of propagation that enables other parties to make or receive copies. Mere interaction with a user through a computer network, with no transfer of a copy, is not conveying.

An interactive user interface displays "Appropriate Legal Notices" to the extent that it includes a convenient and prominently visible feature that (1) displays an appropriate copyright notice, and (2) tells the user that there is no warranty for the work (except to the extent that warranties are provided), that licensees may convey the work under this License, and how to view a copy of this License. If the interface presents a list of user commands or options, such as a menu, a prominent item in the list meets this criterion.

1. Source Code.

The "source code" for a work means the preferred form of the work for making modifications to it. "Object code" means any non-source form of a work.

A "Standard Interface" means an interface that either is an official standard defined by a recognized standards body, or, in the case of interfaces specified for a particular programming language, one that is widely used among developers working in that language.

The "System Libraries" of an executable work include anything, other than the work as a whole, that (a) is included in the normal form of packaging a Major Component, but which is not part of that Major Component, and (b) serves only to enable use of the work with that Major Component, or to implement a Standard Interface for which an implementation is available to the public in source code form. A "Major Component", in this context, means a major essential component (kernel, window system, and so on) of the specific operating system (if any) on which the executable work runs, or a compiler used to produce the work, or an object code interpreter used to run it.

The "Corresponding Source" for a work in object code form means all the source code needed to generate, install, and (for an executable work) run the object code and to modify the work, including scripts to control those activities. However, it does not include the work's System Libraries, or general-purpose tools or generally available free programs which are used unmodified in performing those activities but which are not part of the work. For example, Corresponding Source includes interface definition files associated with source files for the work, and the source code for shared libraries and dynamically linked subprograms that the work is specifically designed to require, such as by intimate data communication or control flow between those subprograms and other parts of the work.

(continues on next page)

(continued from previous page)

The Corresponding Source need not include anything that users can regenerate automatically from other parts of the Corresponding Source.

The Corresponding Source for a work in source code form is that same work.

2. Basic Permissions.

All rights granted under this License are granted for the term of copyright on the Program, and are irrevocable provided the stated conditions are met. This License explicitly affirms your unlimited permission to run the unmodified Program. The output from running a covered work is covered by this License only if the output, given its content, constitutes a covered work. This License acknowledges your rights of fair use or other equivalent, as provided by copyright law.

You may make, run and propagate covered works that you do not convey, without conditions so long as your license otherwise remains in force. You may convey covered works to others for the sole purpose of having them make modifications exclusively for you, or provide you with facilities for running those works, provided that you comply with the terms of this License in conveying all material for which you do not control copyright. Those thus making or running the covered works for you must do so exclusively on your behalf, under your direction and control, on terms that prohibit them from making any copies of your copyrighted material outside their relationship with you.

Conveying under any other circumstances is permitted solely under the conditions stated below. Sublicensing is not allowed; section 10 makes it unnecessary.

3. Protecting Users' Legal Rights From Anti-Circumvention Law.

No covered work shall be deemed part of an effective technological measure under any applicable law fulfilling obligations under article 11 of the WIPO copyright treaty adopted on 20 December 1996, or similar laws prohibiting or restricting circumvention of such measures.

When you convey a covered work, you waive any legal power to forbid circumvention of technological measures to the extent such circumvention is effected by exercising rights under this License with respect to the covered work, and you disclaim any intention to limit operation or modification of the work as a means of enforcing, against the work's users, your or third parties' legal rights to forbid circumvention of technological measures.

4. Conveying Verbatim Copies.

You may convey verbatim copies of the Program's source code as you receive it, in any medium, provided that you conspicuously and appropriately publish on each copy an appropriate copyright notice; keep intact all notices stating that this License and any non-permissive terms added in accord with section 7 apply to the code;

(continues on next page)

(continued from previous page)

keep intact all notices of the absence of any warranty; and give all recipients a copy of this License along with the Program.

You may charge any price or no price for each copy that you convey, and you may offer support or warranty protection for a fee.

5. Conveying Modified Source Versions.

You may convey a work based on the Program, or the modifications to produce it from the Program, in the form of source code under the terms of section 4, provided that you also meet all of these conditions:

- a) The work must carry prominent notices stating that you modified it, and giving a relevant date.
- b) The work must carry prominent notices stating that it is released under this License and any conditions added under section 7. This requirement modifies the requirement in section 4 to "keep intact all notices".
- c) You must license the entire work, as a whole, under this License to anyone who comes into possession of a copy. This License will therefore apply, along with any applicable section 7 additional terms, to the whole of the work, and all its parts, regardless of how they are packaged. This License gives no permission to license the work in any other way, but it does not invalidate such permission if you have separately received it.
- d) If the work has interactive user interfaces, each must display Appropriate Legal Notices; however, if the Program has interactive interfaces that do not display Appropriate Legal Notices, your work need not make them do so.

A compilation of a covered work with other separate and independent works, which are not by their nature extensions of the covered work, and which are not combined with it such as to form a larger program, in or on a volume of a storage or distribution medium, is called an "aggregate" if the compilation and its resulting copyright are not used to limit the access or legal rights of the compilation's users beyond what the individual works permit. Inclusion of a covered work in an aggregate does not cause this License to apply to the other parts of the aggregate.

6. Conveying Non-Source Forms.

You may convey a covered work in object code form under the terms of sections 4 and 5, provided that you also convey the machine-readable Corresponding Source under the terms of this License, in one of these ways:

- a) Convey the object code in, or embodied in, a physical product (including a physical distribution medium), accompanied by the Corresponding Source fixed on a durable physical medium customarily used for software interchange.
- b) Convey the object code in, or embodied in, a physical product

(continues on next page)

(continued from previous page)

(including a physical distribution medium), accompanied by a written offer, valid for at least three years and valid for as long as you offer spare parts or customer support for that product model, to give anyone who possesses the object code either (1) a copy of the Corresponding Source for all the software in the product that is covered by this License, on a durable physical medium customarily used for software interchange, for a price no more than your reasonable cost of physically performing this conveying of source, or (2) access to copy the Corresponding Source from a network server at no charge.

c) Convey individual copies of the object code with a copy of the written offer to provide the Corresponding Source. This alternative is allowed only occasionally and noncommercially, and only if you received the object code with such an offer, in accord with subsection 6b.

d) Convey the object code by offering access from a designated place (gratis or for a charge), and offer equivalent access to the Corresponding Source in the same way through the same place at no further charge. You need not require recipients to copy the Corresponding Source along with the object code. If the place to copy the object code is a network server, the Corresponding Source may be on a different server (operated by you or a third party) that supports equivalent copying facilities, provided you maintain clear directions next to the object code saying where to find the Corresponding Source. Regardless of what server hosts the Corresponding Source, you remain obligated to ensure that it is available for as long as needed to satisfy these requirements.

e) Convey the object code using peer-to-peer transmission, provided you inform other peers where the object code and Corresponding Source of the work are being offered to the general public at no charge under subsection 6d.

A separable portion of the object code, whose source code is excluded from the Corresponding Source as a System Library, need not be included in conveying the object code work.

A "User Product" is either (1) a "consumer product", which means any tangible personal property which is normally used for personal, family, or household purposes, or (2) anything designed or sold for incorporation into a dwelling. In determining whether a product is a consumer product, doubtful cases shall be resolved in favor of coverage. For a particular product received by a particular user, "normally used" refers to a typical or common use of that class of product, regardless of the status of the particular user or of the way in which the particular user actually uses, or expects or is expected to use, the product. A product is a consumer product regardless of whether the product has substantial commercial, industrial or non-consumer uses, unless such uses represent the only significant mode of use of the product.

"Installation Information" for a User Product means any methods, procedures, authorization keys, or other information required to install and execute modified versions of a covered work in that User Product from a modified version of its Corresponding Source. The information must

(continues on next page)

(continued from previous page)

suffice to ensure that the continued functioning of the modified object code is in no case prevented or interfered with solely because modification has been made.

If you convey an object code work under this section in, or with, or specifically for use in, a User Product, and the conveying occurs as part of a transaction in which the right of possession and use of the User Product is transferred to the recipient in perpetuity or for a fixed term (regardless of how the transaction is characterized), the Corresponding Source conveyed under this section must be accompanied by the Installation Information. But this requirement does not apply if neither you nor any third party retains the ability to install modified object code on the User Product (for example, the work has been installed in ROM).

The requirement to provide Installation Information does not include a requirement to continue to provide support service, warranty, or updates for a work that has been modified or installed by the recipient, or for the User Product in which it has been modified or installed. Access to a network may be denied when the modification itself materially and adversely affects the operation of the network or violates the rules and protocols for communication across the network.

Corresponding Source conveyed, and Installation Information provided, in accord with this section must be in a format that is publicly documented (and with an implementation available to the public in source code form), and must require no special password or key for unpacking, reading or copying.

7. Additional Terms.

"Additional permissions" are terms that supplement the terms of this License by making exceptions from one or more of its conditions. Additional permissions that are applicable to the entire Program shall be treated as though they were included in this License, to the extent that they are valid under applicable law. If additional permissions apply only to part of the Program, that part may be used separately under those permissions, but the entire Program remains governed by this License without regard to the additional permissions.

When you convey a copy of a covered work, you may at your option remove any additional permissions from that copy, or from any part of it. (Additional permissions may be written to require their own removal in certain cases when you modify the work.) You may place additional permissions on material, added by you to a covered work, for which you have or can give appropriate copyright permission.

Notwithstanding any other provision of this License, for material you add to a covered work, you may (if authorized by the copyright holders of that material) supplement the terms of this License with terms:

- a) Disclaiming warranty or limiting liability differently from the terms of sections 15 and 16 of this License; or
- b) Requiring preservation of specified reasonable legal notices or author attributions in that material or in the Appropriate Legal

(continues on next page)

(continued from previous page)

Notices displayed by works containing it; or

c) Prohibiting misrepresentation of the origin of that material, or requiring that modified versions of such material be marked in reasonable ways as different from the original version; or

d) Limiting the use for publicity purposes of names of licensors or authors of the material; or

e) Declining to grant rights under trademark law for use of some trade names, trademarks, or service marks; or

f) Requiring indemnification of licensors and authors of that material by anyone who conveys the material (or modified versions of it) with contractual assumptions of liability to the recipient, for any liability that these contractual assumptions directly impose on those licensors and authors.

All other non-permissive additional terms are considered "further restrictions" within the meaning of section 10. If the Program as you received it, or any part of it, contains a notice stating that it is governed by this License along with a term that is a further restriction, you may remove that term. If a license document contains a further restriction but permits relicensing or conveying under this License, you may add to a covered work material governed by the terms of that license document, provided that the further restriction does not survive such relicensing or conveying.

If you add terms to a covered work in accord with this section, you must place, in the relevant source files, a statement of the additional terms that apply to those files, or a notice indicating where to find the applicable terms.

Additional terms, permissive or non-permissive, may be stated in the form of a separately written license, or stated as exceptions; the above requirements apply either way.

8. Termination.

You may not propagate or modify a covered work except as expressly provided under this License. Any attempt otherwise to propagate or modify it is void, and will automatically terminate your rights under this License (including any patent licenses granted under the third paragraph of section 11).

However, if you cease all violation of this License, then your license from a particular copyright holder is reinstated (a) provisionally, unless and until the copyright holder explicitly and finally terminates your license, and (b) permanently, if the copyright holder fails to notify you of the violation by some reasonable means prior to 60 days after the cessation.

Moreover, your license from a particular copyright holder is reinstated permanently if the copyright holder notifies you of the violation by some reasonable means, this is the first time you have received notice of violation of this License (for any work) from that

(continues on next page)

(continued from previous page)

copyright holder, and you cure the violation prior to 30 days after your receipt of the notice.

Termination of your rights under this section does not terminate the licenses of parties who have received copies or rights from you under this License. If your rights have been terminated and not permanently reinstated, you do not qualify to receive new licenses for the same material under section 10.

9. Acceptance Not Required for Having Copies.

You are not required to accept this License in order to receive or run a copy of the Program. Ancillary propagation of a covered work occurring solely as a consequence of using peer-to-peer transmission to receive a copy likewise does not require acceptance. However, nothing other than this License grants you permission to propagate or modify any covered work. These actions infringe copyright if you do not accept this License. Therefore, by modifying or propagating a covered work, you indicate your acceptance of this License to do so.

10. Automatic Licensing of Downstream Recipients.

Each time you convey a covered work, the recipient automatically receives a license from the original licensors, to run, modify and propagate that work, subject to this License. You are not responsible for enforcing compliance by third parties with this License.

An "entity transaction" is a transaction transferring control of an organization, or substantially all assets of one, or subdividing an organization, or merging organizations. If propagation of a covered work results from an entity transaction, each party to that transaction who receives a copy of the work also receives whatever licenses to the work the party's predecessor in interest had or could give under the previous paragraph, plus a right to possession of the Corresponding Source of the work from the predecessor in interest, if the predecessor has it or can get it with reasonable efforts.

You may not impose any further restrictions on the exercise of the rights granted or affirmed under this License. For example, you may not impose a license fee, royalty, or other charge for exercise of rights granted under this License, and you may not initiate litigation (including a cross-claim or counterclaim in a lawsuit) alleging that any patent claim is infringed by making, using, selling, offering for sale, or importing the Program or any portion of it.

11. Patents.

A "contributor" is a copyright holder who authorizes use under this License of the Program or a work on which the Program is based. The work thus licensed is called the contributor's "contributor version".

A contributor's "essential patent claims" are all patent claims owned or controlled by the contributor, whether already acquired or hereafter acquired, that would be infringed by some manner, permitted by this License, of making, using, or selling its contributor version, but do not include claims that would be infringed only as a

(continues on next page)

(continued from previous page)

consequence of further modification of the contributor version. For purposes of this definition, "control" includes the right to grant patent sublicenses in a manner consistent with the requirements of this License.

Each contributor grants you a non-exclusive, worldwide, royalty-free patent license under the contributor's essential patent claims, to make, use, sell, offer for sale, import and otherwise run, modify and propagate the contents of its contributor version.

In the following three paragraphs, a "patent license" is any express agreement or commitment, however denominated, not to enforce a patent (such as an express permission to practice a patent or covenant not to sue for patent infringement). To "grant" such a patent license to a party means to make such an agreement or commitment not to enforce a patent against the party.

If you convey a covered work, knowingly relying on a patent license, and the Corresponding Source of the work is not available for anyone to copy, free of charge and under the terms of this License, through a publicly available network server or other readily accessible means, then you must either (1) cause the Corresponding Source to be so available, or (2) arrange to deprive yourself of the benefit of the patent license for this particular work, or (3) arrange, in a manner consistent with the requirements of this License, to extend the patent license to downstream recipients. "Knowingly relying" means you have actual knowledge that, but for the patent license, your conveying the covered work in a country, or your recipient's use of the covered work in a country, would infringe one or more identifiable patents in that country that you have reason to believe are valid.

If, pursuant to or in connection with a single transaction or arrangement, you convey, or propagate by procuring conveyance of, a covered work, and grant a patent license to some of the parties receiving the covered work authorizing them to use, propagate, modify or convey a specific copy of the covered work, then the patent license you grant is automatically extended to all recipients of the covered work and works based on it.

A patent license is "discriminatory" if it does not include within the scope of its coverage, prohibits the exercise of, or is conditioned on the non-exercise of one or more of the rights that are specifically granted under this License. You may not convey a covered work if you are a party to an arrangement with a third party that is in the business of distributing software, under which you make payment to the third party based on the extent of your activity of conveying the work, and under which the third party grants, to any of the parties who would receive the covered work from you, a discriminatory patent license (a) in connection with copies of the covered work conveyed by you (or copies made from those copies), or (b) primarily for and in connection with specific products or compilations that contain the covered work, unless you entered into that arrangement, or that patent license was granted, prior to 28 March 2007.

Nothing in this License shall be construed as excluding or limiting any implied license or other defenses to infringement that may

(continues on next page)

(continued from previous page)

otherwise be available to you under applicable patent law.

12. No Surrender of Others' Freedom.

If conditions are imposed on you (whether by court order, agreement or otherwise) that contradict the conditions of this License, they do not excuse you from the conditions of this License. If you cannot convey a covered work so as to satisfy simultaneously your obligations under this License and any other pertinent obligations, then as a consequence you may not convey it at all. For example, if you agree to terms that obligate you to collect a royalty for further conveying from those to whom you convey the Program, the only way you could satisfy both those terms and this License would be to refrain entirely from conveying the Program.

13. Use with the GNU Affero General Public License.

Notwithstanding any other provision of this License, you have permission to link or combine any covered work with a work licensed under version 3 of the GNU Affero General Public License into a single combined work, and to convey the resulting work. The terms of this License will continue to apply to the part which is the covered work, but the special requirements of the GNU Affero General Public License, section 13, concerning interaction through a network will apply to the combination as such.

14. Revised Versions of this License.

The Free Software Foundation may publish revised and/or new versions of the GNU General Public License from time to time. Such new versions will be similar in spirit to the present version, but may differ in detail to address new problems or concerns.

Each version is given a distinguishing version number. If the Program specifies that a certain numbered version of the GNU General Public License "or any later version" applies to it, you have the option of following the terms and conditions either of that numbered version or of any later version published by the Free Software Foundation. If the Program does not specify a version number of the GNU General Public License, you may choose any version ever published by the Free Software Foundation.

If the Program specifies that a proxy can decide which future versions of the GNU General Public License can be used, that proxy's public statement of acceptance of a version permanently authorizes you to choose that version for the Program.

Later license versions may give you additional or different permissions. However, no additional obligations are imposed on any author or copyright holder as a result of your choosing to follow a later version.

15. 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

(continues on next page)

(continued from previous page)

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.

16. 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.

17. Interpretation of Sections 15 and 16.

If the disclaimer of warranty and limitation of liability provided above cannot be given local legal effect according to their terms, reviewing courts shall apply local law that most closely approximates an absolute waiver of all civil liability in connection with the Program, unless a warranty or assumption of liability accompanies a copy of the Program in return for a fee.

END OF TERMS AND CONDITIONS

How to Apply These Terms to Your New Programs

If you develop a new program, and you want it to be of the greatest possible use to the public, the best way to achieve this is to make it free software which everyone can redistribute and change under these terms.

To do so, attach the following notices to the program. It is safest to attach them to the start of each source file to most effectively state the exclusion of warranty; and each file should have at least the "copyright" line and a pointer to where the full notice is found.

```
<one line to give the program's name and a brief idea of what it does.>
Copyright (C) <year> <name of author>
```

```
This program is free software: you can redistribute it and/or modify
it under the terms of the GNU General Public License 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 General Public License for more details.
```

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

(continues on next page)

(continued from previous page)

Also add information on how to contact you by electronic and paper mail.

If the program does terminal interaction, make it output a short notice like this when it starts in an interactive mode:

```
<program> Copyright (C) <year> <name of author>
This program comes with ABSOLUTELY NO WARRANTY; for details type `show w'.
This is free software, and you are welcome to redistribute it
under certain conditions; type `show c' for details.
```

The hypothetical commands `show w' and `show c' should show the appropriate parts of the General Public License. Of course, your program's commands might be different; for a GUI interface, you would use an "about box".

You should also get your employer (if you work as a programmer) or school, if any, to sign a "copyright disclaimer" for the program, if necessary. For more information on this, and how to apply and follow the GNU GPL, see [<https://www.gnu.org/licenses/>](https://www.gnu.org/licenses/).

The GNU General Public License does not permit incorporating your program into proprietary programs. If your program is a subroutine library, you may consider it more useful to permit linking proprietary applications with the library. If this is what you want to do, use the GNU Lesser General Public License instead of this License. But first, please read [<https://www.gnu.org/licenses/why-not-lgpl.html>](https://www.gnu.org/licenses/why-not-lgpl.html).

2.1 Simple Extraction

2.1.1 Open the app

Start the application by entering in the terminal:

```
python -m datadigitizer
```

The main windows looks like in figure *Main Window*

A quick overview of the different commands is shown in **Help->How to use**.

2.1.2 Load the image

Load an image from which you want to extract data by pressing <Ctrl-o> or from **File->Load Image**. Browse to the image and click OK.

2.1.3 Position XY Limits

Position 4 crosses for the axis limits in the order Xmin, Xmax, Ymin, Ymax by pointing them with the mouse and adding them by pressing <Ctrl-a>. You can hold down <a>, point with the mouse and left click for adding a red cross.

2.1.4 Set XY Limits

Press in the order <Ctrl-k>, <Ctrl-j>, <Ctrl-h>, <Ctrl-g>. It will set the Ymax, Ymin, Xmax and Xmin from the last (selected) data point, respectively.

- When <Ctrl-k> is pressed, the last of the 4 red crosses will become the Ymax value and will be colored in blue.
- When <Ctrl-j> is pressed, the last of the 3 red crosses will become the Ymin value and will be colored in blue.
- When <Ctrl-h> is pressed, the last of the 2 red crosses will become the Xmax value and will be colored in green.
- When <Ctrl-g> is pressed, the last red cross will become the Xmin value and will be colored in green.

You can set the XY limits in the different order if needed and you can also set all the limits at once from the last (selected) 4 data points (red crosses) by pressing <Ctrl-l>.

It is also possible to select a limit with a left click and adjust it by pressing left, right, up and down.

The limits can be reverted to data by pressing <Ctrl-n>.

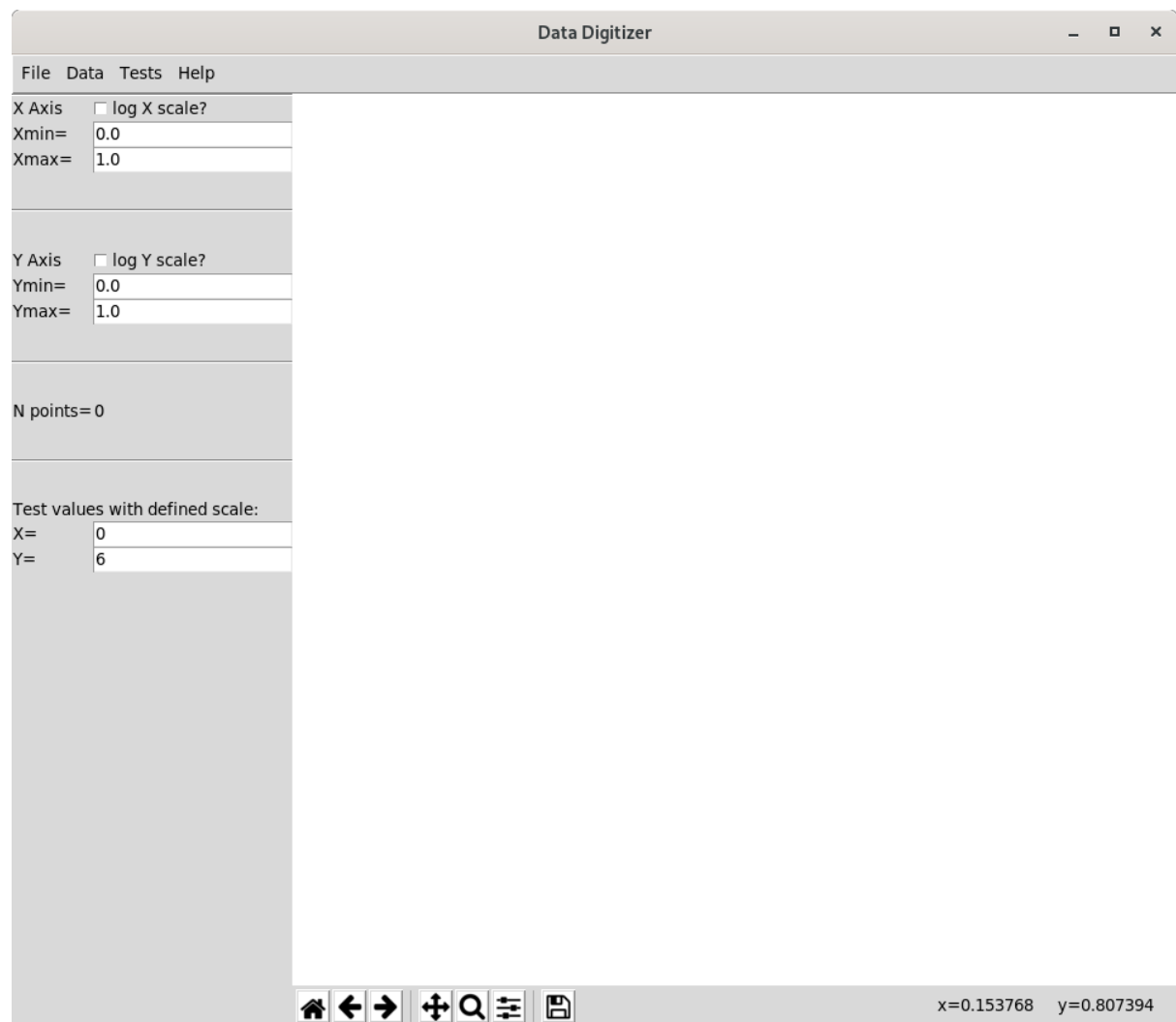


Fig. 1: Main Window

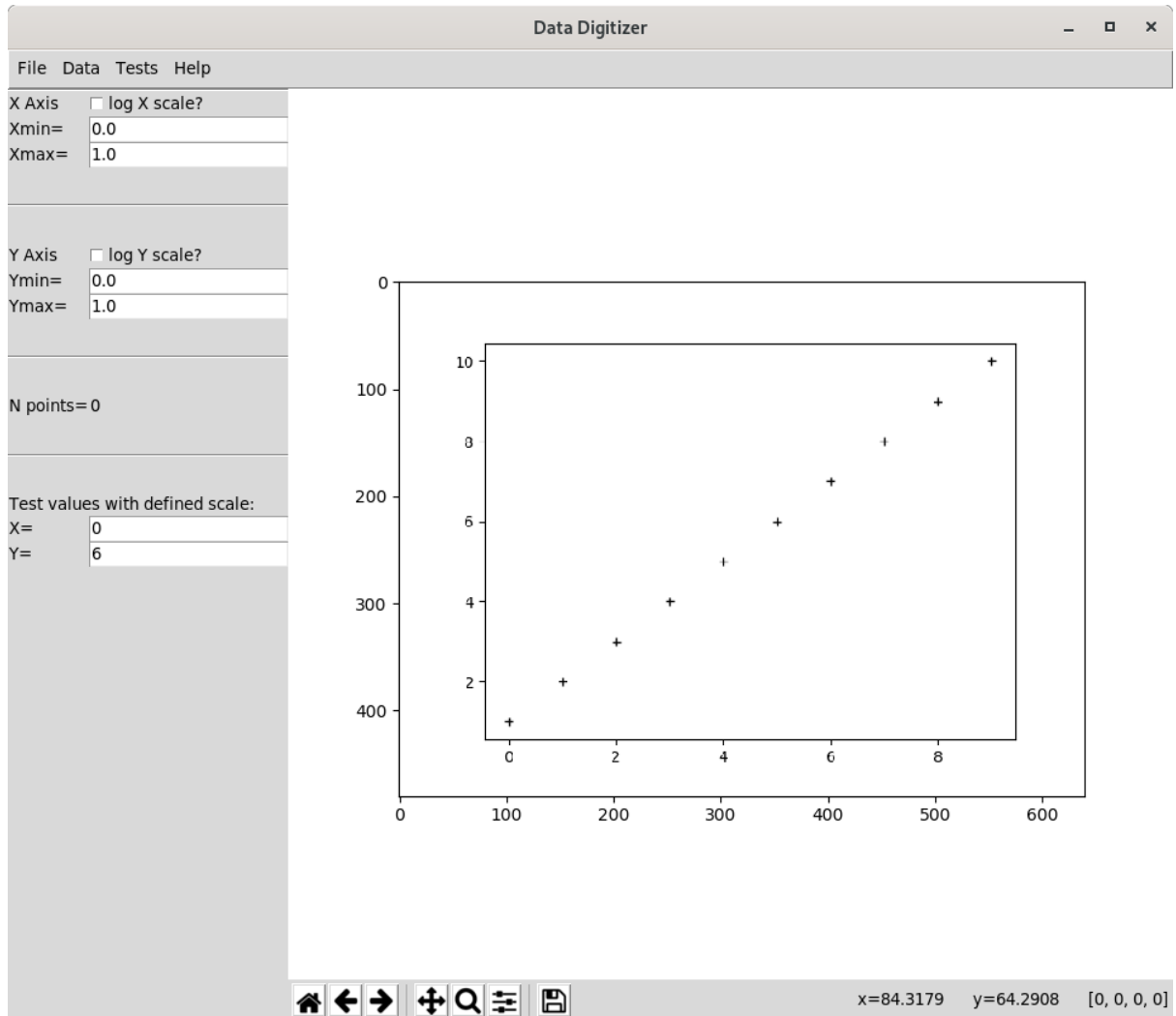


Fig. 2: Load the image from which to extract data

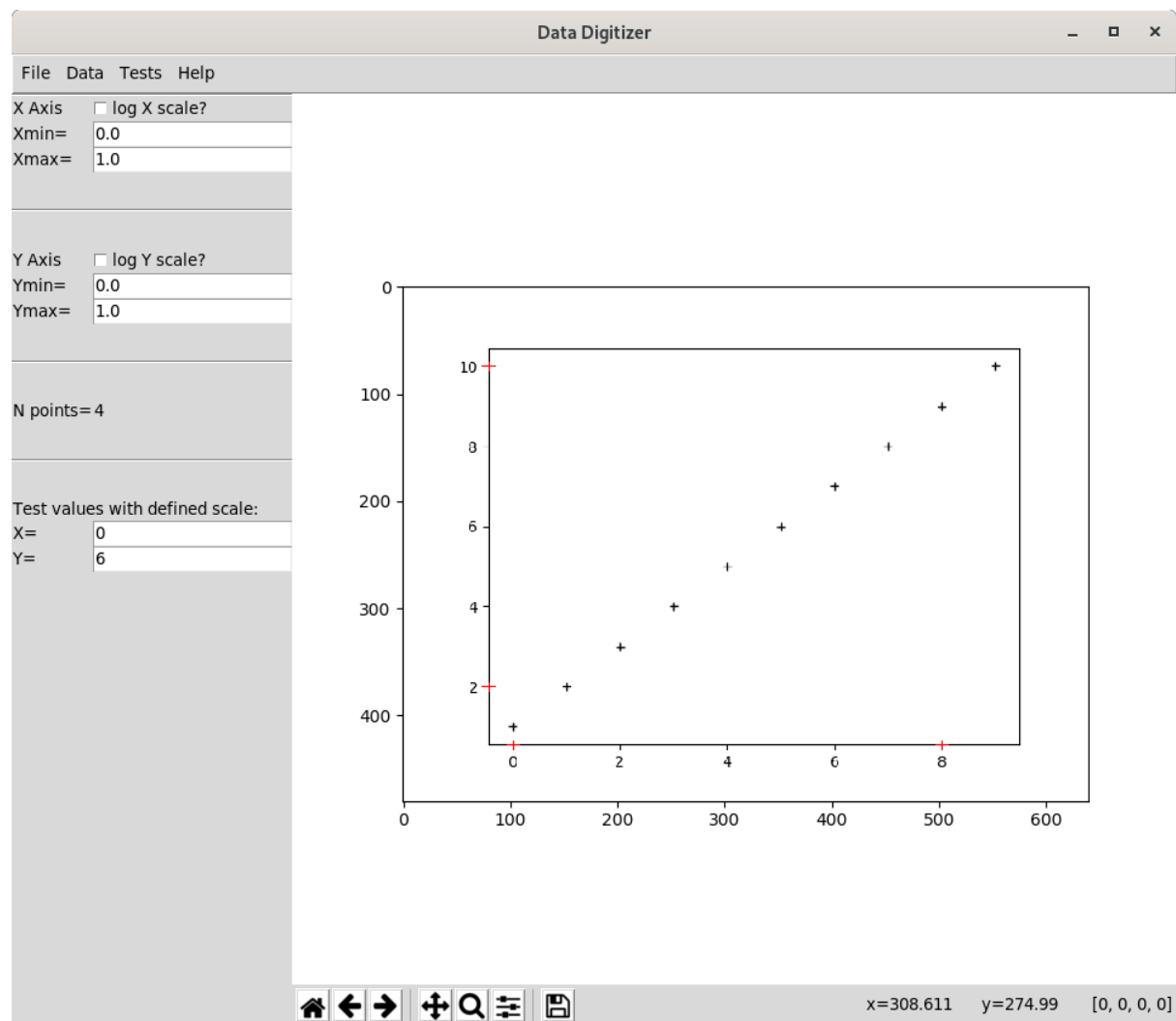


Fig. 3: Position limits for x and y axes

All shortcuts commands are also available through the menu Data.

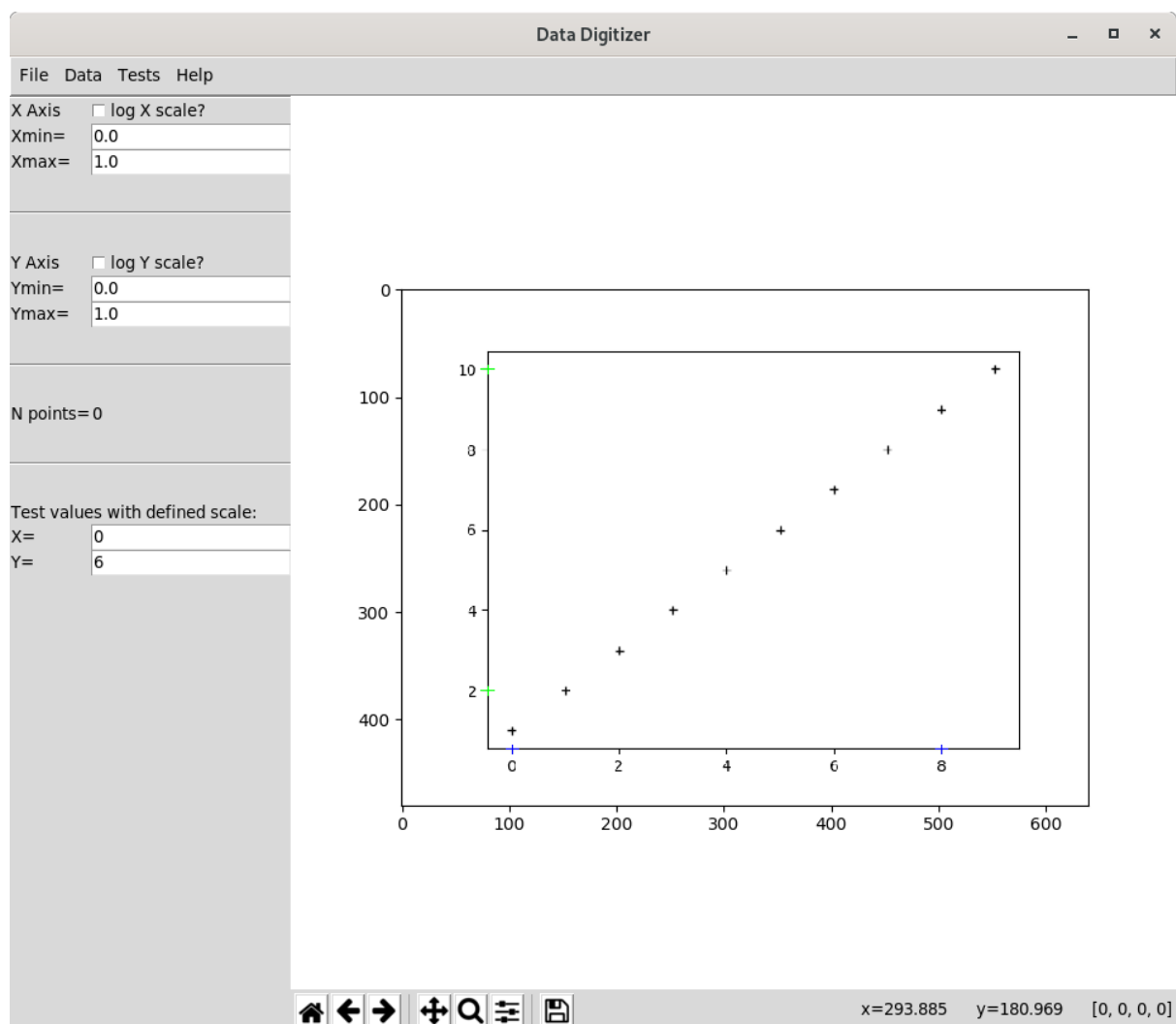


Fig. 4: Set XY limits

2.1.5 Enter XY Limits

Enter the corresponding value for Xmax, Xmin, Ymin and Ymax and press <Enter>. Switch to log scales if needed.

2.1.6 Add Data Points

Add data points by pointing them with the mouse and adding them by pressing <Ctrl-a>. You can hold down <a>, point with the mouse and left click for adding a red cross. Once a data point is added you can adjust its position by pressing left, right, up and down arrows. Press <Ctrl-m> or from the menu Data->Compute to compute the data with the defined XY scales. Press <Ctrl-s> or from the menu File->Save Data to save data.

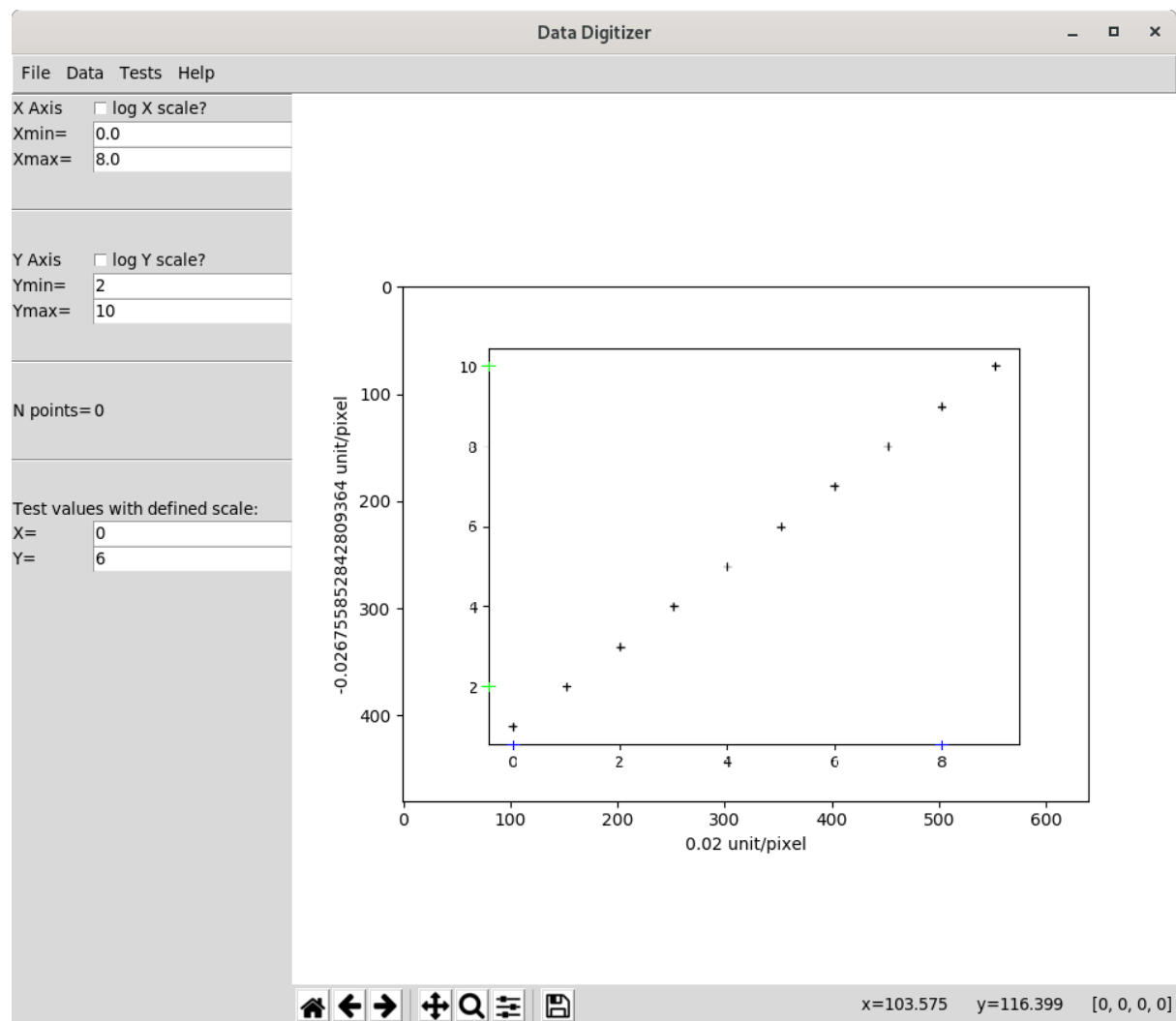


Fig. 5: Enter XY values

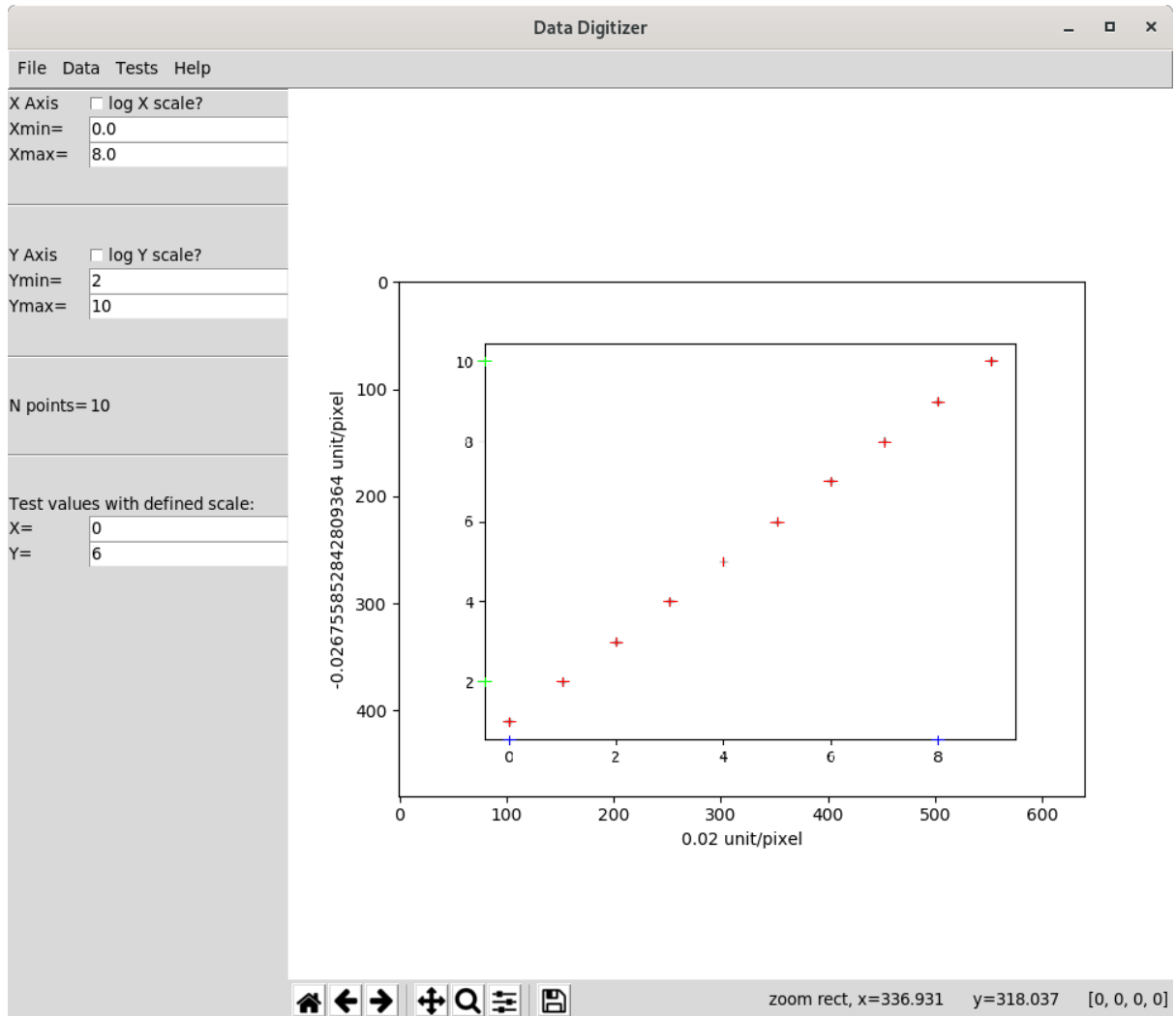
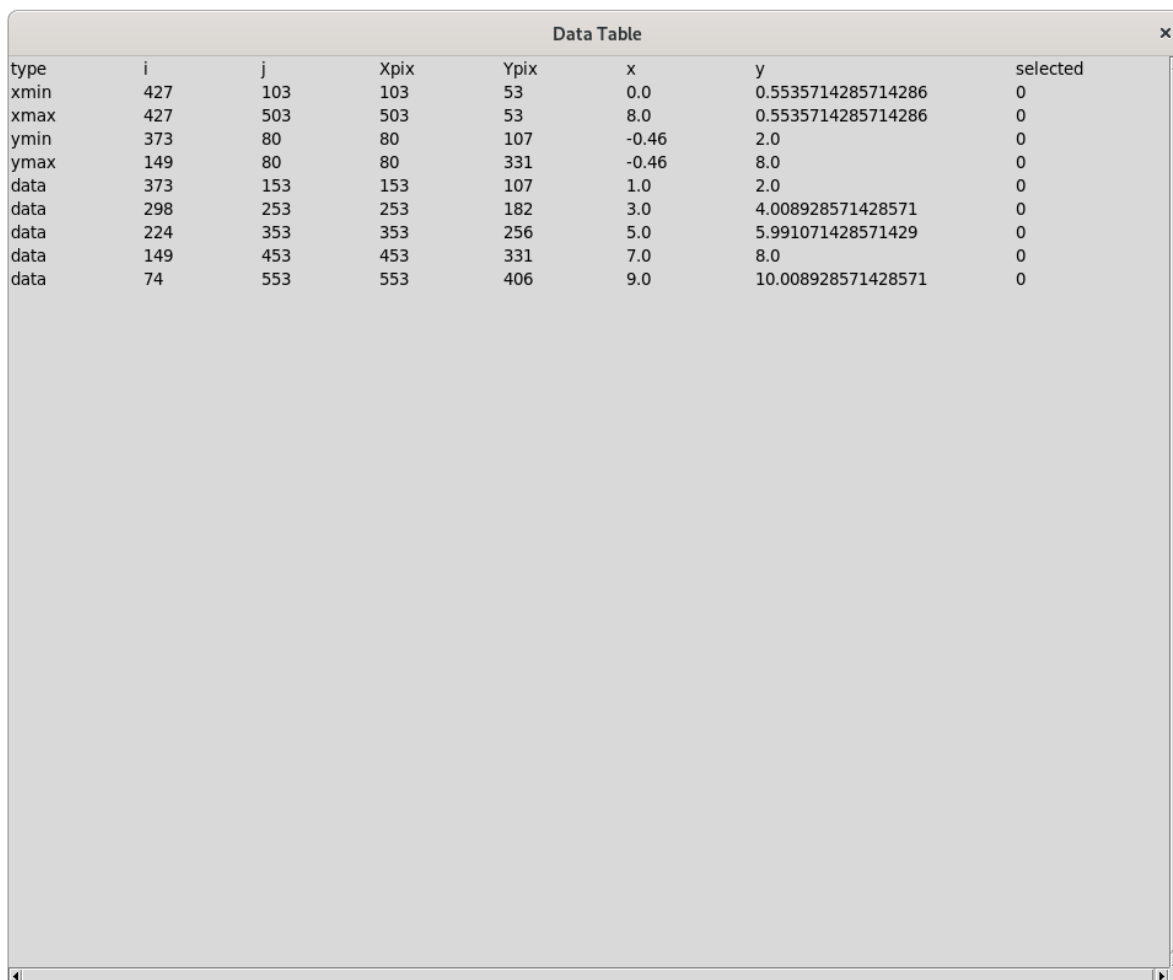


Fig. 6: Set data values

2.1.7 View Data Points

The data values can be seen by pressing <Ctrl-t> or through the menu Data.



The screenshot shows a window titled "Data Table" with a close button (X) in the top right corner. The window contains a table with 8 columns: type, i, j, Xpix, Ypix, x, y, and selected. The table lists various data points, including minimum and maximum coordinates, and several data points with their corresponding X and Y values. The 'selected' column for all entries is 0.

type	i	j	Xpix	Ypix	x	y	selected
xmin	427	103	103	53	0.0	0.5535714285714286	0
xmax	427	503	503	53	8.0	0.5535714285714286	0
ymin	373	80	80	107	-0.46	2.0	0
ymax	149	80	80	331	-0.46	8.0	0
data	373	153	153	107	1.0	2.0	0
data	298	253	253	182	3.0	4.008928571428571	0
data	224	353	353	256	5.0	5.991071428571429	0
data	149	453	453	331	7.0	8.0	0
data	74	553	553	406	9.0	10.008928571428571	0

Fig. 7: View data table

2.2 Test Scale Values

It is also possible to test the X/Y scales by entering values, e.g. X=0 and Y=6, press <Enter> to check if the scales are properly set.

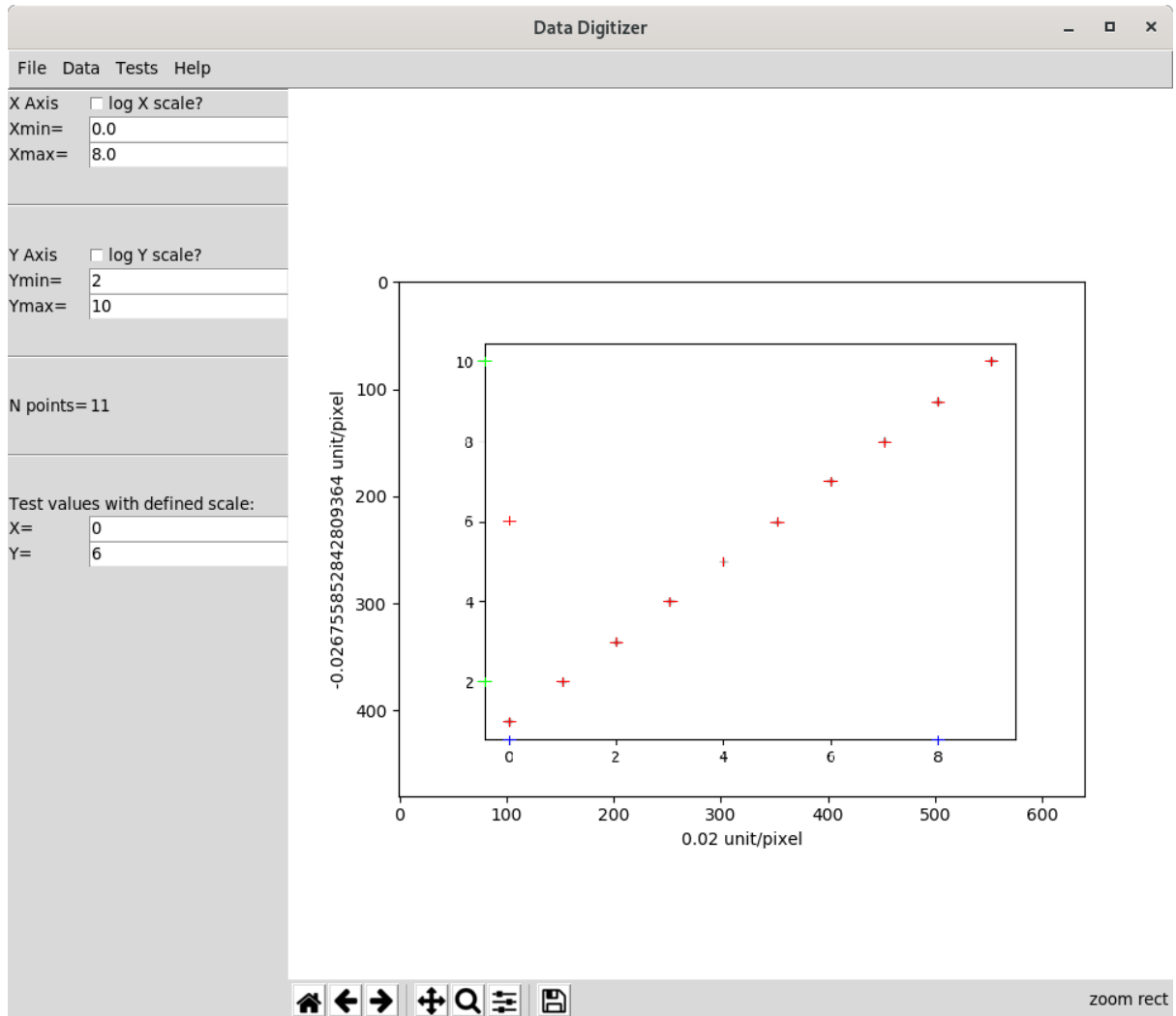


Fig. 8: Test scale

RELEASE NOTES

3.1 Data Digitizer 1.1.0 Release Note

3.1.1 Highlights

- Data table for visualizing the extracted data values as a toplevel window.
- Documentation bug fixes and improvements.

3.1.2 New Features

Data are visible as an array.

3.1.3 Download

PyPI

3.1.4 Contributors

Milan Skocic

3.1.5 Commits

[#c718aca](#)-MilanSkocic-DOC: Refractor getting started section.

[#4ecada4](#)-MilanSkocic-DOC: Add data table view in tutorial.

[#27f49ef](#)-MilanSkocic-ENH: Chnage window title for data window.

[#e32798c](#)-MilanSkocic-DOC: Add view data in tutorial.

[#9ead219](#)-MilanSkocic-REL: Change version number.

[#a418ce7](#)-MilanSkocic-DOC: Hot fix of github address.

[#43a9db5](#)-MilanSkocic-RLS: Add online doc folder in archives.

[#01a862a](#)-MilanSkocic-MAINT: Revert to dev release number.

[#2b3650f](#)-MilanSkocic-RLS: Update changelog.

[#8d3c9de](#)-MilanSkocic-DOC: Fix code block in README.

[#66a9767](#)-MilanSkocic-DOC: Add other documentation for API section.

[#5767a2e](#)-MilanSkocic-DOC: Refractor document structure.

[#52bb0d4](#)-MilanSkocic-RLS: Prepare new version number.

#d9786d5-MilanSkocic-DOC: Fix extension error in setup.py.
#cd7ffb81-MilanSkocic-DOC: Prepare and refactor release notes and changelogs.
#aac968d-MilanSkocic-DOC: Minor fixes in tutorial.
#5e1c9d2-MilanSkocic-REL: Minor fix in compatibility note.
#f561581-MilanSkocic-ENH: Renamed internal variables in conversion func
#c062190-MilanSkocic-DOC, STY: Added doc and fixed f-strings.
#85db500-Milan Skocic-DOC: Added link to Github repo in documentation.
#e206cd9-Milan Skocic-Deleted old documentation generation
#1671b9e-MilanSkocic-DOC: Minor fix.
#c9184c4-MilanSkocic-DOC: Minor fixes in documentation.
#d37e8b7-MilanSkocic-TST: Added tests for generating test plots. The path type is checked.
#6725698-MilanSkocic-ENH: Placed data table in toplevel window.
#7a66ed2-MilanSkocic-ENH: Minor fixes in fstrings.
#71c39d5-MilanSkocic-ENH: Fixed index error in DataTable
#1c6d83d-MilanSkocic-DOC: Added doctring to main function in DataTable.
#5214b30-MilanSkocic-ENH: Minor fixes.
#a475c8c-Milan Skocic-ENH: Fixed resize issue with scrollable frame for data.
#c594b97-Milan Skocic-ENH: Added functional table of data.
#e952533-MilanSkocic-ENH: Started implementing data table widget.
#85108df-MilanSkocic-ENH: Added entries for X and Y units.

3.2 Data Digitizer 1.0.2 Release Note

3.2.1 Highlights

- Documentation minor fixes.
- Explicit internal functions for converting (i,j) array indexes to (xpix, ypix) graph indexes
- Added data folder as an option for folder profile.

3.2.2 Future Changes

The data table will be visible in version 1.1 during the process of drawing data from the shortcut <Ctrl-t> or through the menu Data->View Data.

3.2.3 Compatibility notes

The full data array is now saved instead of (x, y) columns only. This changes does not bring any compatibility issue but it is worth mentionning that the format has changed.

3.2.4 Download

PyPI

3.2.5 Contributors

Milan Skocic

3.2.6 Commits

[#c90ebea](#)-MilanSkocic-ENH: Conversion as private functions

[#be87095](#)-MilanSkocic-ENH: Added conversion functions from i,j matrix indexes to xypix graph pixels

[#94d1081](#)-MilanSkocic-ENH: Separated array indexes i,j and pixel indexes in graph

[#d39ca8f](#)-MilanSkocic-ENH: Added folder options and full data array save

[#5d0150d](#)-MilanSkocic-ENH: Added options in folder profile

[#61acb28](#)-MilanSkocic-ENH: Refractoring according to pylint and mypy

3.3 Data Digitizer 1.0.1 Release Note

3.3.1 Highlights

Documentation minor fixes.

3.3.2 Contributors

Milan Skocic

3.3.3 Commits

[#12ea7cb](#)-MilanSkocic-DOC: Minor corrections in tutorial.rst.

[#b171b83](#)-MilanSkocic-DOC: Minor corrections in tutorial.

3.4 Data Digitizer 1.0.0 Release Note

3.4.1 Highlights

Initial release with basic features:

- Import image
- Set scale
- Multiple selection of data points

- Compute and save data

3.4.2 Contributors

Milan Skocic

3.4.3 Commits

PR#5-BUG: Fixed unwanted autoscale for each draw of the image threshold.

PR#4-ENH: New features with interactive points

PR#3-ENH: Cleanup.

PR#2-ENH: Added tests in the main app.

PR#1-ENH: Added tests.

#63fa293-Implementing FigureFrame in main app.

#6b25247-Initial commit with functional GUI and basic functions for adding points.

AUTOGENERATED DOCUMENTATION

4.1 Graphical FrontEnd

Main GUI.

Copyright (C) 2020-2021 Milan Skocic.

This program is free software: you can redistribute it and/or modify it under the terms of the GNU General Public License 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 General Public License for more details.

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

Author: Milan Skocic <milan.skocic@gmail.com>

class datadigitizer.gui.**AboutWindow**(*master*)

About window.

Parameters

master: tkinter widget Container.

class datadigitizer.gui.**App**(*master=None*)

The cursor is used to point a specific position in the graph whereas all operations are done through keyboard combinations or through the main menu.

Legend:

- Red crosses are data points
- Blue crosses are Xmin and Xmax
- Green crosses are Ymin and Ymax

Commands:

- <Ctrl-o> for loading image.
- <Ctrl-a> add data point.
- <Hold a+Left Click> add data point.
- <Left Click> select a data point.
- <Hold Ctrl+Left Click> multiple data point selection.
- <Ctrl-g> set Xmin from last data point or from selected data point.
- <Ctrl-h> set Xmax from last data point or from selected data point.
- <Ctrl-j> set Ymin from last data point or from selected data point.

- <Ctrl-k> set Ymax from last data point or from selected data point
- <Ctrl-l> set all limits from last 4 data points or from last 4 selected data points.
- <Ctrl-n> remove all limits.
- <Ctrl-z> remove last data point.
- <Ctrl-d> remove selected data point.
- <Ctrl-D> remove all data points.
- <Ctrl-m> compute the data points.
- <Ctrl-t> view data table.
- <Ctrl-s> save data points.
- <Ctrl-w> clear all.

Parameters

master: tkinter.Tk instance Root instantiation of tkinter.

Methods

<code>run()</code>	Start the application.
<code>stop()</code>	Stop the main tk loop.

`run()`

Start the application.

`stop()`

Stop the main tk loop.

class `datadigitizer.gui.DataTable(master, **kwargs)`

Scrolled data table widget.

Parameters

master: tkinter widget Master container.

kwargs: dict, optional Keyword arguments for the scrolled frame.

Methods

<code>set_new_data(data)</code>	Set new data in the displayed data table.
---------------------------------	---

`set_new_data(data)`

Set new data in the displayed data table.

Parameters

data [structured array, shape=(n,)] Numpy structured array used for registering the extracted data.

class `datadigitizer.gui.DataWindow(master)`

How to use window.

Parameters

master: tkinter widget Container.

class `datadigitizer.gui.FigureFrame(master, **kwargs)`

Tk frame encapsulating a matplotlib figure and a toolbar.

Parameters

kwargs: dict, optional Keyword arguments for the tk frame.

Methods

<code>refresh()</code>	Refresh the plot.
------------------------	-------------------

`refresh()`

Refresh the plot.

class `datadigitizer.gui.HowToUse(master)`

How to use window.

Parameters

master: tkinter widget Container.

class `datadigitizer.gui.ScrolledFrame(master, **kwargs)`

Scrolled Frame widget which may contain other widgets and can have a 3D border.

Parameters

master: tkinter widget Master container.

kwargs: dict, optional Keyword arguments for the scrolled frame.

Attributes

`canvas` Return the canvas that contains the scrollbars.

`frame` Return the frame that contains the widgets.

property canvas

Return the canvas that contains the scrollbars.

property frame

Return the frame that contains the widgets.

class `datadigitizer.gui.Transform(values_min: float, values_max: float, pix_min: Union[int, float], pix_max: Union[int, float], which: str = 'linear')`

Transform class converting values coordinates into pixel coordinates.

Parameters

values_min: int, float Minimum value.

values_max: int, float Maximum value.

pix_min: int, float Minimum pixel.

pix_max: int, float Maximum pixel.

which: str, optional Which kind of transform i.e. linear or log.

Attributes

`backward_scale` Return the scale for transforming pixels into values.

`forward_scale` Return the scale for transforming values into pixels.

Methods

<code>backward(x)</code>	Transform pixels to values.
<code>forward(x)</code>	Transform values to pixels.

backward(*x*: *Union[int, float, numpy.ndarray]*)

Transform pixels to values.

Parameters

x: int or floats or array-like, shape(n,) Pixels to be transformed.

Returns

values: int or floats or array-like, shape(n,) Values corresponding to the pixels.

Notes

$$x = (x_{pix} - x_{pix,min}) \frac{x_{max} - x_{min}}{x_{pix,max} - x_{pix,min}} + x_{min}$$

property backward_scale

Return the scale for transforming pixels into values.

$$\frac{x_{max} - x_{min}}{x_{pix,max} - x_{pix,min}}$$

forward(*x*: *Union[int, float, numpy.ndarray]*)

Transform values to pixels.

Parameters

x: int or floats or array-like, shape(n,) Values to be transformed.

Returns

pixels: int or floats or array-like, shape(n,) Values corresponding to the pixels.

Notes

$$x_{pix} = (x - x_{min}) \frac{x_{pix,max} - x_{pix,min}}{x_{max} - x_{min}} + x_{pix,min}$$

property forward_scale

Return the scale for transforming values into pixels.

$$\frac{x_{pix,max} - x_{pix,min}}{x_{max} - x_{min}}$$

4.2 Icon

Create icon for the app.

Copyright (C) 2020-2021 Milan Skocic.

This program is free software: you can redistribute it and/or modify it under the terms of the GNU General Public License 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 General Public License for more details.

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

Author: Milan Skocic <milan.skocic@gmail.com>

4.3 Settings

Settings module.

Copyright (C) 2020-2021 Milan Skocic.

This program is free software: you can redistribute it and/or modify it under the terms of the GNU General Public License 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 General Public License for more details.

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

Author: Milan Skocic <milan.skocic@gmail.com>

`datadigitizer.settings.read_cfg(cfg_folder: str, cfg_name: str, cfg_default: Dict, update: bool = True)`
Read a configuration file.

Parameters

cfg_folder: str. Path the configuration folder.

cfg_name: str. Name of the configuration folder.

cfg_default: dict. Dictionnary with defaults values.

update: bool Flag for indicating if the default section has to be updated.

`datadigitizer.settings.read_profiles()`
Read all the profiles.

`datadigitizer.settings.save_cfg(cfg_folder, cfg_name, cfg)`
Save the configuration file.

Parameters

cfg_folder: str. Path to the configuration folder.

cfg_name: str Name of the configuration file.

cfg: ConfigParser

Returns

None

4.4 Tests

Tests module.

Copyright (C) 2020-2021 Milan Skocic.

This program is free software: you can redistribute it and/or modify it under the terms of the GNU General Public License 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 General Public License for more details.

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

Author: Milan Skocic <milan.skocic@gmail.com>

class `datadigitizer.tests.TestPlotData`(*methodName*='runTest')

Create an instance of the class that will use the named test method when executed. Raises a ValueError if the instance does not have a method with the specified name.

Methods

<code>test_linear()</code>	Test linear plot.
<code>test_loglog()</code>	Test log-log plot.
<code>test_xlog()</code>	Test x semi-log plot.
<code>test_ylog()</code>	Test y semi-log plot.

test_linear()

Test linear plot.

test_loglog()

Test log-log plot.

test_xlog()

Test x semi-log plot.

test_ylog()

Test y semi-log plot.

`datadigitizer.tests.test_linear()` → `pathlib.Path`
Generate the linear plot and data.

Returns

fpath: Path object Path to the linear plot.

`datadigitizer.tests.test_loglog()` → `pathlib.Path`
Generate the log-log plot and data.

Returns

fpath: Path object Path to the log-log plot.

`datadigitizer.tests.test_xlog()` → `pathlib.Path`
Generate the semi-log plot and data.

Returns

fpath: Path object Path to the semi-log plot.

`datadigitizer.tests.test_ylog()` → `pathlib.Path`
Generate the semi-log plot and data.

Returns

fpath: Path object Path to the semi-log plot.

INDICES AND TABLES

- `genindex`
- `modindex`
- `search`

PYTHON MODULE INDEX

d

`datadigitizer.gui`, [29](#)
`datadigitizer.icon`, [32](#)
`datadigitizer.settings`, [33](#)
`datadigitizer.tests`, [34](#)

A

AboutWindow (class in datadigitizer.gui), 29

App (class in datadigitizer.gui), 29

B

backward() (datadigitizer.gui.Transform method), 32

backward_scale (datadigitizer.gui.Transform property), 32

C

canvas (datadigitizer.gui.ScrolledFrame property), 31

D

datadigitizer.gui
module, 29

datadigitizer.icon
module, 32

datadigitizer.settings
module, 33

datadigitizer.tests
module, 34

DataTable (class in datadigitizer.gui), 30

DataWindow (class in datadigitizer.gui), 30

F

FigureFrame (class in datadigitizer.gui), 30

forward() (datadigitizer.gui.Transform method), 32

forward_scale (datadigitizer.gui.Transform property), 32

frame (datadigitizer.gui.ScrolledFrame property), 31

H

HowToUse (class in datadigitizer.gui), 31

M

module

datadigitizer.gui, 29

datadigitizer.icon, 32

datadigitizer.settings, 33

datadigitizer.tests, 34

R

read_cfg() (in module datadigitizer.settings), 33

read_profiles() (in module datadigitizer.settings),
33

refresh() (datadigitizer.gui.FigureFrame method),
31

run() (datadigitizer.gui.App method), 30

S

save_cfg() (in module datadigitizer.settings), 33

ScrolledFrame (class in datadigitizer.gui), 31

set_new_data() (datadigitizer.gui.DataTable
method), 30

stop() (datadigitizer.gui.App method), 30

T

test_linear() (datadigitizer.tests.TestPlotData
method), 34

test_linear() (in module datadigitizer.tests), 34

test_loglog() (datadigitizer.tests.TestPlotData
method), 34

test_loglog() (in module datadigitizer.tests), 34

test_xlog() (datadigitizer.tests.TestPlotData
method), 34

test_xlog() (in module datadigitizer.tests), 34

test_ylog() (datadigitizer.tests.TestPlotData
method), 34

test_ylog() (in module datadigitizer.tests), 34

TestPlotData (class in datadigitizer.tests), 34

Transform (class in datadigitizer.gui), 31