

# **Pigsurfer 1.0**

## **Comprehensive manual**

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## Introduction

The PigSurfer software provides functionality to gather data from pig farms, import / export this data, and provide feedback to a farm owner in the form of a report including benchmarks. The software distinguishes two different kinds of users: observers and supervisors. The observers gather survey data on farms, using the questionnaires the supervisor provides. Later on, they export their data to the supervisor, who in turn sends back data for international benchmarking (national benchmarking works without supervisor feedback). Thus, the tasks of the supervisor are to provide questionnaires, to collate the data gathered by the observers, and to provide data for international benchmarking.

The **software** comes with three installation types:

1. Desktop – Supervisor (PigSurfer\_Supervisor\_.... .jar):  
This is the supervisor version as a runnable java file. It will only be used by Sabine.
2. Desktop – Observer (PigSurfer\_Observer\_.... .jar):  
This is the observer version as a runnable java file.
3. Android – Observer (PigSurfer\_Android\_... .apk):  
This is the observer version for installation to an Android tablet device.

You need to have "Java Runtime Environment" installed on your PC / laptop in order to run the software. If you do not have it installed, you can download Java from <http://www.java.com/de/download/> . You will need administrator rights for installation.

The third installation type is an android application package and can only be installed on devices running the Android operating system, such as certain tablets or smartphones.

In addition to the software you need to have a **database file** (ending with \*.sqlite) in order to use Pigsurfer. The database file contains the questionnaires and any data you enter. Therefore, this is the file you always want to back up.

Technically speaking, the software provides a local web server. Thus, in order to use Pigsurfer, you will have to start the software, reference the \*.sqlite file to use, and then go with your internet browser to <http://localhost:8080>.

As the supervisor version will only be used by Sabine, it will not be referenced any further.

## Installation

### **Desktop version (PigSurfer\_Observer\_.... .jar)**

Before installing, be sure to have a Java Runtime Environment installed as described in the introduction. Download / copy the file PigSurfer\_Observer\_.... .jar to your computer and then start it by double-clicking the .jar file<sup>1</sup>.

You will have received a database file from Sabine which contains the questionnaires and which will also contain your data (PigSurfer\_XX\_... .sqlite). For trying it out, save a copy of PigSurfer\_XX\_... .sqlite with the software and rename it so that you know, it's the file with which you have tested Pigsurfer and which does not contain your data. For real data collection, you'd best save PigSurfer\_XX\_... .sqlite on a (micro) SD card, which you can also use in the tablet.

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<sup>1</sup> Note that, depending on from where you download the software, it might happen that the file endings are changed from ".jar" to ".zip" or something else. Before starting the software, you have to change the ending back to ".jar".

Once you have started collecting data, always use one PigSurfer\_XX\_... .sqlite file! The best method is to only use the PigSurfer\_XX\_... .sqlite file on the SD card, meaning when you use Pigsurfer on your PC or laptop also directly reference the file on the card from Pigsurfer. Make regular backup copies. (For details see “Data handling / practical tips” below.)

## **Android version (PigSurfer\_Android\_... .apk)**

### Accessing the SD card

In order to install the android version of PigSurfer, you need to copy the "PigSurfer\_Android\_.... .apk" and the database file to the SD card of your android device. The following steps are necessary to do so:

1. Insert the SD card into the tablet.
2. Connect the tablet to the PC / laptop via the USB cable.
3. On tablet: In the top left corner of the screen appears a small icon, indicating that an USB connection has been established.
4. On tablet: Touch the icon and pull it downwards
5. On tablet: On the opening screen, press the button to establish a USB data connection.
6. On PC / laptop: A new drive will show up in the file explorer. Go to that drive and open the folder "sdcard".

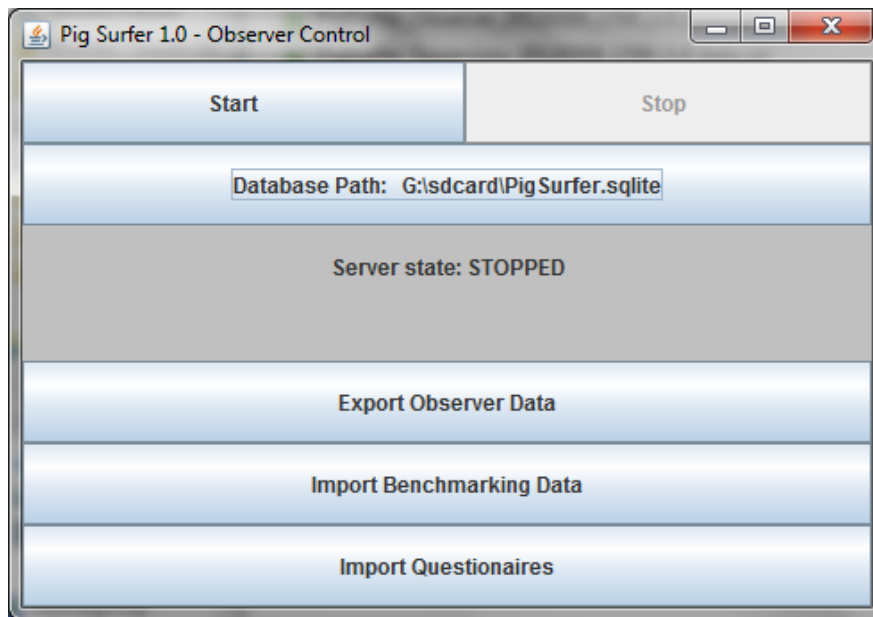
### Installing the application

7. On PC / laptop: Copy PigSurfer\_Android\_.... .apk and PigSurfer\_XX\_... .sqlite to the "sdcard" directory. You can also make a directory (e.g. called "Pigsurfer") in which to place the files. However, you will need to remember, where the file is saved (directly in "sdcard" or in a directory in "sdcard", because you will have to enter the path and file name on the tablet (see Usage: Software control > Android version).
8. On tablet: Deactivate the USB data connection.
9. On tablet: Start the application "ApkInstaller".
10. On tablet: Select "Install".
11. On tablet: Select "TF Card" as path.
12. On tablet: Select the "PigSurfer\_Android\_... .apk" and finish the installation.

## **Usage – Software control**

### **Desktop version (PigSurfer\_Observer\_.... .jar)**

After double clicking of PigSurfer\_Observer\_.... .jar the following window opens up:



### “Start” / “Stop” the Server

Pressing "Start" will start the web server enabling usage of PigSurfer via internet browser. Likewise, "Stop" will stop the server. The grey field below the "Database Path: ..." button will show the current server state (and any other notices).

### Selecting the Database (“Database path: ...”)

Pressing the "Database Path: ..." button will open a dialog where you can select the path and file name of the database file you want to use (i.e. the one on the SD card). If you do not yet have a database file, you can also enter a file name. After you have imported questionnaires a new database file with the name you have assigned will be created.

### Export Observer Data

After pressing this button, you can select a database file to which export your survey data. Usually, this will be a non-existing file that will be automatically created during the export.

### Import Benchmarking Data

After pressing this button, you can select a database file containing benchmarking data (which will be sent to you by Sabine during the course of the project). This will add anonymous data from farms not assessed by you to enlarge the benchmarking data base.

### Import Questionnaires

After pressing this button, you can select a \*.sqlite file containing questionnaire definitions, which has been provided by Sabine. However, this only works, if you refer to a database file which does not yet contain a questionnaire definition, that is, a new file. Note that when importing benchmarking data, the questionnaires are automatically imported, too. Thus, you do not need to import the questionnaires after importing benchmarking data.

## **Android Version**

### “Start” / “Stop” the Server

Pressing "Start" will start the web server enabling usage of PigSurfer via the browser. Likewise, "Stop" will stop the server. The field in the bottom half of the screen will show the current state of the server. Note that before first starting the server, you have to specify the path to the database

file (see below).

### Selecting the Database ("Database path: ...")

In order to be able to start the server on the android version, you have to type in the path and name of the database file relative to the "sdcard" directory. Thus, for example, if your database file is named "PigSurfer.sqlite", and it is placed directly in the "sdcard" directory, you just type in "PigSurfer.sqlite". If you have created a directory called "Pigsurfer" in the "sdcard" directory and placed the file in there, you would have to type "Pigsurfer/PigSurfer.sqlite".

### Usage – PigSurfer: Entering data


Once you have installed PigSurfer and started the server (the software) you can enter data via your internet browser. You can take any browser you like, but Andreas (the programmer) recommends Google Chrome, because it supports range checks on numeric input fields. This is also the browser which is already installed on your android device.


In order to enter data, you have to provide the following URL in the address field of the browser: "http://localhost:8080". In the following, a walkthrough will be presented, illustrating the use of PigSurfer. It assumes a fresh database received from the supervisor (Sabine).

### Walkthrough: Entering data


If this is the first time on this day that you are using PigSurfer, the "Credits" screen will appear:

**PigSurfer 1.0 Credits**

 PigSurfer has been created for the [ProPiG project](#) of the [Friedrich Löffler Institut](#).


 PigSurfer has been written by

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Web [www.softwareingenieurplus.de](http://www.softwareingenieurplus.de)

 Powered by **jetty://**

PigSurfer is powered by [Jetty](#), an open source, lightweight web server.

Jetty is distributed under the [Apache License, Version 2.0](#).

 PigSurfer is powered by [Ormlite](#), an open source, lightweight persistence library.

Ormlite is distributed under the [ISC license](#).

[OpenCSV](#)

PigSurfer is powered by [OpenCSV](#), an open source, lightweight reader/writer library for CSV files.

OpenCSV is distributed under the [Apache License, Version 2.0](#).

[Use PigSurfer](#)

Click on "Use PigSurfer" to start using the software. If this is your first time you are using the current database, you will first have to enter your name:

**Edit observer:**

First name:	<input type="text"/>
Last name:	<input type="text"/>

After entering your name and pressing "Save", you will be directed to the main menu:

**PigSurfer 1.0**

[Credits](#)

Here you can select the questionnaire you need depending on which part of assessment you are at. "Farm report" leads you to the reporting screen, which will be described at the end of this walkthrough.

After clicking on a button in the list, you will first be asked to enter a new farm (or select a farm if you are e.g. moving from interview to direct observations):

**Choose farm for Interview:**

Since there is no farm stored in the database yet, you have to enter the farm you want to do the survey for after clicking "New farm...":

**Edit farm:**

Country:	Germany ▾
Identifier:	12

In this example, we have a farm in Germany, to which we assign the identifier (farm number) "12". After saving the farm information, you will be directed to the survey selection screen:

**Choose survey:**

Similar to the farm selection, you have to choose a new survey here, since no prior interview is available in the database. Clicking "New survey..." will open a new interview:

**Interview**

**basic**

1. farm name	<input type="text"/>
2. interview partner	<input type="text"/>

**farm**

3. How many pigs are on your farm today?  
sows: 1st insemination onwards; sows or gilts in service area = pregnant sows;  
 weaners: weaning until 35 kg; fatteners: >35 kg including gilts

lactating sows	<input type="text"/> (0 ... 10000)
pregnant sows	<input type="text"/> (0 ... 10000)
weaners	<input type="text"/> (0 ... 10000)

Here you can actually start with your interview by entering values<sup>2</sup>. In some questionnaires you will have to specify a some point whether the farm keeps pigs indoors, outdoors or both. In the interview this is specified at question 14. If a farm has animals indoor and outdoor tick the boxes for both:

14. Pigs on this farm are being kept:

indoor

outdoor

Depending on what you have selected, you will see questions for indoor housing, outdoor housing or both on the next screen. If you have made a mistake, simply save everything, and recall the questionnaire form the start screen. You can then change your selections / answers.

Clicking on "Save + Proceed" will save all entered data to the database and proceed with the survey. At this point, Pigsurfer checks for mistakes and also missing data. As none of the questions were answered, all are marked violet. (Unfortunately, it was not possible to apply the "missing data" check to non-remark fields only in this Pigsurfer version.)

<sup>2</sup> Note that the Screenshot is taken from the browser Google Chrome, which supports the numerical input type. You can see this from the up / down arrows. Firefox or Internet Explorer do not support the numeric input format at the time the software was written.



**Interview**

Error(s):

  (not answered - hit button to proceed anyway)

**basic**

1. farm name	<input style="width: 100%; height: 15px;" type="text"/>
2. interview partner	<input style="width: 100%; height: 15px;" type="text"/>

**farm**

3. How many pigs are on your farm today?  
sows: 1st insemination onwards; sows or gilts in service area = pregnant sows;  
 weaners: weaning until 35 kg; fatteners: >35 kg including gilts

lactating sows	<input style="width: 100%; height: 15px;" type="text"/> (0 ... 10000)
pregnant sows	<input style="width: 100%; height: 15px;" type="text"/> (0 ... 10000)
weaners	<input style="width: 100%; height: 15px;" type="text"/> (0 ... 10000)
fatteners	<input style="width: 100%; height: 15px;" type="text"/> (0 ... 10000)

Clicking "Save + Proceed" a second time will save everything as is and take you to the next page of the interview. Don't worry if you have made a mistake. You can re-access any filled out questionnaire from the start screen and change the information.

On the second page of the interview, the button to save the data is labelled "Save" instead of "Save + Proceed" because it is the last page of the interview. Pressing "Save" will save the entered data and direct you back to the main menu (if necessary, asking you for the confirmation of the non-answered questions before doing so).

There are two more aspects to the filling out of an interview, which will be described now. First, choose "Interview" from the main menu again. This time the farm selection screen will look like this:

**Choose farm for Interview:**

You can now select the previously entered farm "Germany 12". When you select it, the survey selection screen will appear:

**Choose survey:**

Here you can select the interview that we just did by date. If you select the existing interview, the first page of the interview will open again, displaying all the values you entered on this page before. Let us now enter some illegal number values <sup>3</sup>:

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<sup>3</sup> This would not be possible in Google Chrom, because Chrome only allows valid values tob e entered.

<b>3. How many pigs are on your farm today?</b> sows: 1st insemination onwards; sows or gilts in service area = pregnant sows; weaners: weaning until 35 kg; fatteners: >35 kg including gilts	
<b>lactating sows</b>	two (0 ... 10000)
<b>pregnant sows</b>	11000 (0 ... 10000)
<b>weaners</b>	7831 (0 ... 10000)
<b>fatteners</b>	(0 ... 10000)

Clicking "Save + Proceed" now will lead to the following error messages:

**Interview**

Error(s):

■ (type mismatch) 
 ■ (range exceeded) 
 ■ (not answered)

**basic**

1. farm name

2. interview partner

**farm**

<b>3. How many pigs are on your farm today?</b> sows: 1st insemination onwards; sows or gilts in service area = pregnant sows; weaners: weaning until 35 kg; fatteners: >35 kg including gilts	
<b>lactating sows</b>	two (0 ... 10000)
<b>pregnant sows</b>	11000 (0 ... 10000)
<b>weaners</b>	7831 (0 ... 10000)
<b>fatteners</b>	(0 ... 10000)
<b>4. How many dairy cows?</b>	(0 ... 10000)

We have entered a wrong type (lactating sows: text instead of a number) and an out-of-range value (pregnant sows: 11000, where only values up to 10000 are allowed). Correcting these two errors will let you proceed with the interview, where, again, PigSurfer will ask for confirmation of empty input fields if necessary. Type mismatch may also occur when you have used a comma (,) instead of a dot (.) as decimal separator

Another aspect of the interview, that shall be shown here, appears when proceeding to, for example, question 81 on the second page:

## feeding

79. How much straw do you use as roughage or bedding on the farm in total?  t / year (0 ... 100000)

80. remarks

81ff diet content

86ff diet composition

The "Edit" buttons will direct you to a tabular input form for "diet content" or "diet composition". For example, pressing the "Edit" button for diet content (maybe twice, depending on the appearance of the empty-value-confirmation) will lead to this input form:

**diet content**

		pregnant sows	lactating sows	creep feeding	weaners 1	weaners 2	fatteners 1	fatteners 2	fatteners 3		
kg concentrate fed per animal and day	kg DM / animal / day (0.0 ... 20.0)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	kg DM / animal / day (0.0 ... 20.0)	kg concentrate fed per animal and day
kg roughage fed per animal and day	kg DM / animal / day (0.0 ... 20.0)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	kg DM / animal / day (0.0 ... 20.0)	kg roughage fed per animal and day
metabolisable energy	MJ / kg	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	MJ / kg	metabolisable energy

Filling this out and pressing "Save + Proceed" will take you back to the second page of the interview, from where you can proceed further.

### Walkthrough: Farm report

This step should be done on laptop or PC, because the tablet might crash due to low memory capacities.

For generating a report with the summed up information collected on the farm, go to the start screen and select "Farm Report". Selecting the farm you want to do the report for (in our case, only "Germany 12" is available) will present you with the report for this farm:

## Report for farm Germany 12:

### Farm summary

1. farm: --- (Not enough input values available.)

2. farm type: --- (Not enough input values available.)

3. current pig stock:

lactating sows: 2

pregnant sows: 10000

weaners: 7831

Not surprisingly, the report does not contain very much information, since we have almost not filled out anything. When enough data is available, the report will list all information necessary for the summary, including benchmarks. Otherwise it will state "Not enough input values available.". The following screen shot shows two example benchmarks for test data:

### Health and welfare

1. pregnant sows: investigating enrichment:

20% best farms				20% worst farms	Your farm on 02.05.2012 (mean based on 4 value(s))
52.5 - 41.5 %	41.5 - 38.5 %	38.5 - 34.2 %	34.2 - 27.8 %	27.8 - 11.6 %	31.2 %

2. pregnant sows: investigating other:

20% best farms				20% worst farms	Your farm on 02.05.2012 (mean based on 4 value(s))
22.0 - 25.6 %	25.6 - 28.0 %	28.0 - 35.4 %	35.4 - 41.7 %	41.7 - 55.3 %	37.8 %

The benchmarking displays a value for the considered farm and relates it to all known values of all other farms by generating quintiles and colour-coding the quintile of the considered farm.

Please note that calculating the report will take longer the more benchmarking data is available. This can take well over a minute on a PC, so there is no need to worry, when the result is not displayed immediately. Since your android device will have considerably less computing power than your PC / laptop, the computation is likely to timeout. Thus, you will want to generate the report on your desktop / laptop device.

## **Data handling**

I would recommend to create a test database with TEST as part of the file name for you to try things out. Then make a new database for farm assessment.

### **The database (your collected data)**

Only use one database file (\*.sqlite). Make regular back-up copies as described below.

- 1) Insert a SD card into the tablet.
- 2) Connect the tablet to the PC / laptop via the USB cable.
- 3) Establish a USB data connection (see “Installation > Android version”).
- 4) Save the database file you want to use on the SD card as described in “Installation > Android version”

For recording an interview on your laptop:

- 5) connect the tablet via USB with your laptop
- 6) Open Pigsurfer and reference the database on the SD card via “Database path: ...”.
- 7) Start Pigsurfer, record the interview in your web browser, close Pigsurfer
- 8) Detach the tablet (icon for detaching hardware in lower right corner on Windows screen, just like for USB sticks etc.) and disconnect the cable.

For recording data at the pigs:

- 9) Start Pigsurfer on the tablet
- 10) Reference the database on the SD card
- 11) Record your observations

For generating the farm report:

- 12) Reconnect the tablet with the laptop
- 13) Open and start Pigsurfer (still referencing the database file on the SD card).
- 14) Open Pigsurfer in your browser and select “Farm report” on the start screen.

All data from one farm need to be in the same database in order to generate the report. Sticking to the routing described will prevent data losses and inconsistencies.

## **Backing up data**

Make regular backup copies of your database (\*.sqlite) file. In order to do so, make a copy of the \*.sqlite file on the SD card. Save the copy in a folder for your backups and add the date when you copied it to the file name. Please keep the backup copies until the end of the project.

## **Exporting data for Sabine**

In Pigsurfer with your database referenced click on “Export Observer Data to Database”. You will be asked to enter a file name and location. Usually, this will be a non-existing file that will be automatically created during the export. After you have created the file, send it via e-mail to

sabine.dippel@fli.bund.de.

### **Importing data for international benchmarking**

During a later stage of the project you will receive the anonymous data from the others to enable an international benchmarking. Sabine will send you a \*.sqlite file, which you can then import by clicking "Import Benchmarking Data" and choosing this file.

Note that this import will not create duplicate entries of the surveys that you have sent to Sabine. Duplicate entries will not be imported. Thus, with every import you will only be importing new data.

### **Data entry**

#### **be safe**

You should always carry a paper version for all questionnaires in order to be able to assess the farm on paper. Technical devices tend to crash, break or develop strange lives of their own, therefore it's good to have a backup. For printing, open the questionnaire on your laptop or PC and print it via the print function. Try to print from Internet Explorer or Google Chrome, as printouts from Firefox look strange.

#### **moving through questionnaires**

You should try to avoid jumping between questionnaires or taking shortcuts. Finish one questionnaire, e.g. interview, save it, then go to the next questionnaire. If you have to interrupt the interview because the farmer's wife has to be rushed to hospital for getting her baby, click "safe + continue" until you have reached "save". You can then come back to enter the lacking information later. If you skip the save-part you might lose data.

#### **from ... to ... / between ... and ...**

If a farmer answers "between X and Y" or "from X and Y" in a question for which you need to enter a number → calculate and enter the mean between the values.

#### **which answer to choose**

If the answer by the farmer lies between answer possibilities → select the "worse" option. E.g. farmer cleans 3 times per week and possible answers are "daily, weekly, monthly" → select "weekly".

#### **no answer opportunity**

When you find e.g. a husbandry system which is not listed as an answer for selection → use remarks field.

#### **missing data (n/a)**

When you cannot assign a score or make a measurement or assessment, because the item you want to assess is not there → tick "n/a". For example when there is no slurry on the farm all questions regarding slurry storage should be answered n/a (= not available, not applicable).

**diets content & ad libitum feeding**

kg concentrates and kg roughages are required per animal and day, but farmer applies ad libitum feeding → try and get some information from the farmer on how much of each feedstuff he uses each week/month and for how many pigs and to make the calculation this way.

**land use, crops yields etc.**

Use average from last 12 months previous to visit.