

Симулятор физических процессов и явлений

Программа симулятор – замечательная
домашняя лаборатория

Автор: Михаил Горохов

Цель SimPhysX

- Повышение уровня практических знаний у обучающихся

Этапы

- I) Поиск необходимых материалов
- II) Разделение работы на подэтапы
- III) Разработка ПО

Поиск материалов

- Язык программирования Python3
 - Numpy
 - Pygame
 - tkinter
- IDE: PyCharm
- Знания:
 - Мякишев. Электродинамика
 - Интернет статьи
 - Документация
 - Видеоуроки
 - Собственные эксперименты

Разделение работы

- 1) Выбор первого явления (сцены)
- 2) Изучение материала
- 3) Разработка ПО
- 4) Тестирование ПО. Обновления

Архитектура ПО.

Модули

- 1) Физика. Математика. Расчеты
- 2) Backend. Основная часть программы.
Симуляция
- 3) Frontend. Графический интерфейс.
Анимация

Editing the Space

Now you have 3 fields

Charge (C):	0.00015	ID:	1	ID:	1
Position x (m):	+2.0	Charge (C):	-0.0008	ID:	2
Position y (m):	-1.0	Position x (m):	2.0		
		Position y (m):	-2.0		

Create a new field

Edit the field

Delete the field

Clear the Space

View info about the field

q = -0.0002 C
x = 2.0 m
y = -2.0 m

fps: 1.19
x: 4.05
y: 1.51
Potential: -908654.38
Intensity: [-65324.45650265 -282259.76933236]

SimPhysX - Electrostatic Fields

Run

2: Favorites

Platform and Plugin Updates: PyCharm Community Edition is ready to update. (7 minutes ago)

Platform and Plugin Updates
PyCharm Community Edition is ready to
[update.](#)

Editing the Space

Untitled 1 - LibreOffice ...

SimPhysX - Electrostatic...

SimPhysX - [~/Yandex....

Inactive

Wednesday, February 21, 2018
07:14

fps:4.87

x:1.48

y:-1.68

Potential:0

Intensity:[0. 0.]

fps:4.77
x:2.15
y:-1.17
Potential:0
Intensity:[0. 0.]

Editing the Space

You have 0 fields

Charge (C):	<input type="text"/>	ID:	<input type="text"/>	ID:	<input type="text"/>	View info about the field
Position x (m):	<input type="text"/>	Charge (C):	<input type="text"/>	ID:	<input type="text"/>	
Position y (m):	<input type="text"/>	Position x (m):	<input type="text"/>	Position y (m):	<input type="text"/>	

Create a new field

Edit the field

Delete the field

Clear the Space

q =
x =
y =

Platform and Plugin Updates: PyCharm Community Edition is ready to update. (33 minutes ago)

Editing the Space

Untitled 1 - LibreOffice ...

SimPhysX - Electrostatic Fields

SimPhysX - [~/Yandex....

ScreenShots - File Man...

Inactive

Wednesday, February 21, 2018
07:39

2:1 LF+ UTF-8+

SimPhysX - Electrostatic Fields

fps:1.11
x:4.84
y:-3.27
Potential:469512.56
Intensity:[54669.80660819 -60791.685994]

Editing the Space

Now you have 1 fields

Charge (C):	<input type="text" value="0.0003"/>	ID:	<input type="text"/>	ID:	<input type="text" value="q"/>
Position x (m):	<input type="text" value="1.0"/>	Charge (C):	<input type="text"/>	View info about the field	
Position y (m):	<input type="text" value="1.0"/>	Position x (m):	<input type="text"/>	q = 0.0003 C	
		Position y (m):	<input type="text"/>	x = 1.0 m	
<input type="button" value="Create a new field"/>		<input type="button" value="Edit the field"/>		<input type="button" value="Delete the field"/>	
				<input type="button" value="Clear the Space"/>	

y = 1.0 m

Platform and Plugin Updates: PyCharm Community Edition is ready to update. (33 minutes ago)

Editing the Space

Untitled 1 - LibreOffice ...

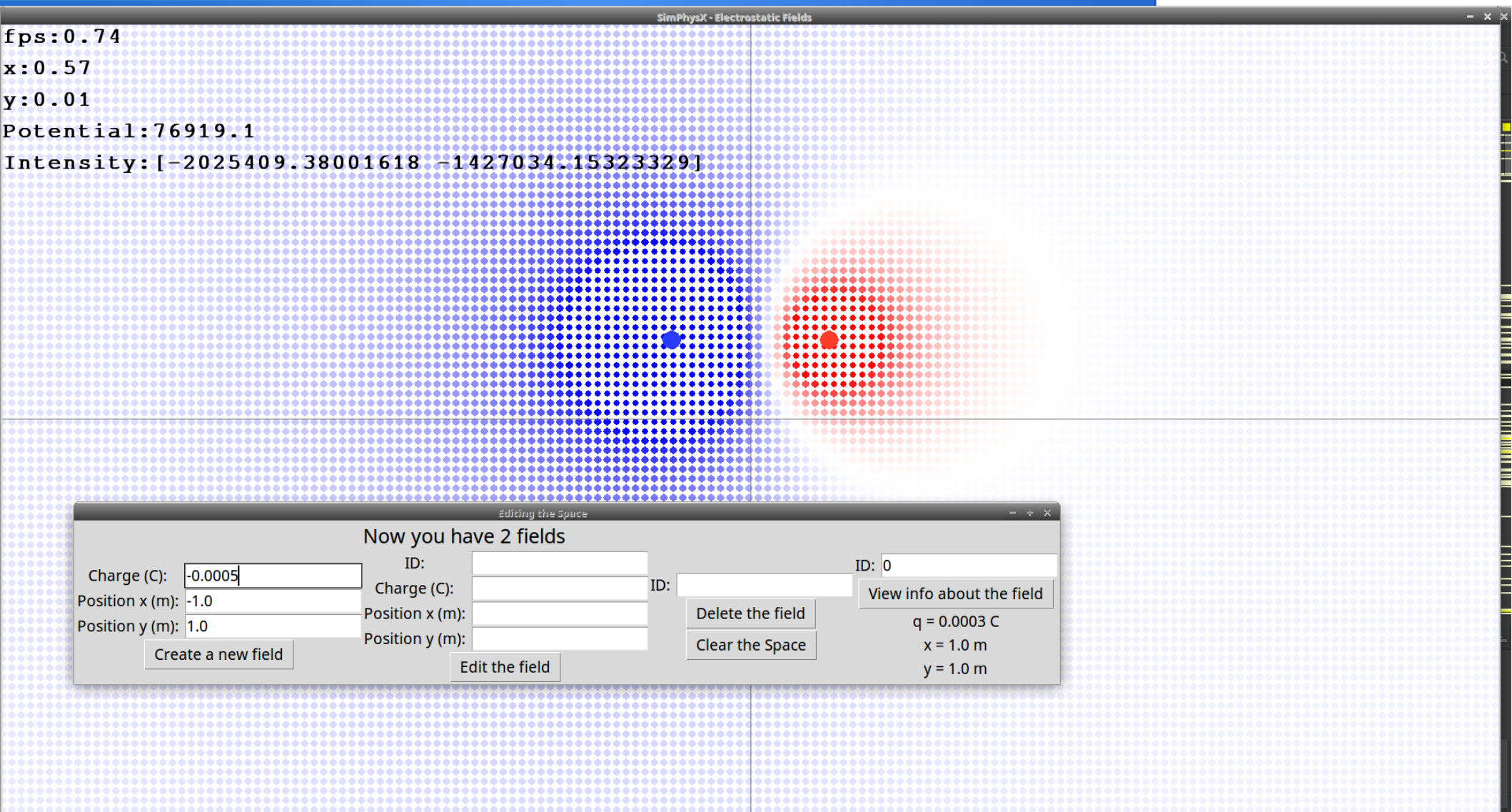
SimPhysX - Electrostatic Fields

SimPhysX - [~/Yandex....

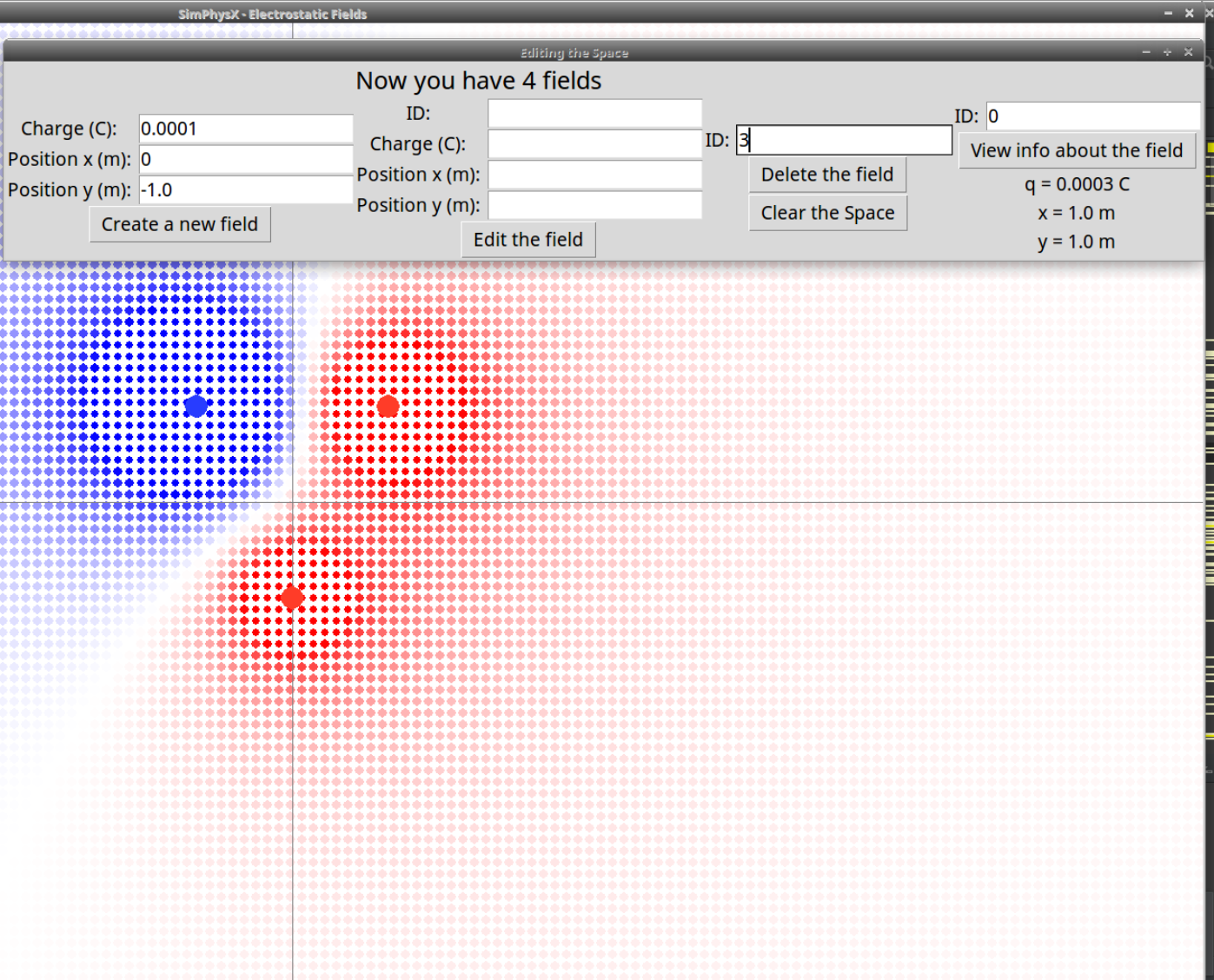
ScreenShots - File Man...

3:1 LF+ UTF-8+

Wednesday, February 21, 2018 07:39



fps:0.44
x:-3.3
y:-1.04
Potential:-350524.22
Intensity:[83130.42684084 262467.]



Platform and Plugin Updates: PyCharm Community Edition is ready to update. (36 minutes ago)

Editing the Space

Untitled 1 - LibreOffice ...

SimPhysX - Electrostatic Fields

SimPhysX - [~/Yandex...

ScreenShots - File Man...

Inactive

Wednesday, February 21, 2018
07:42

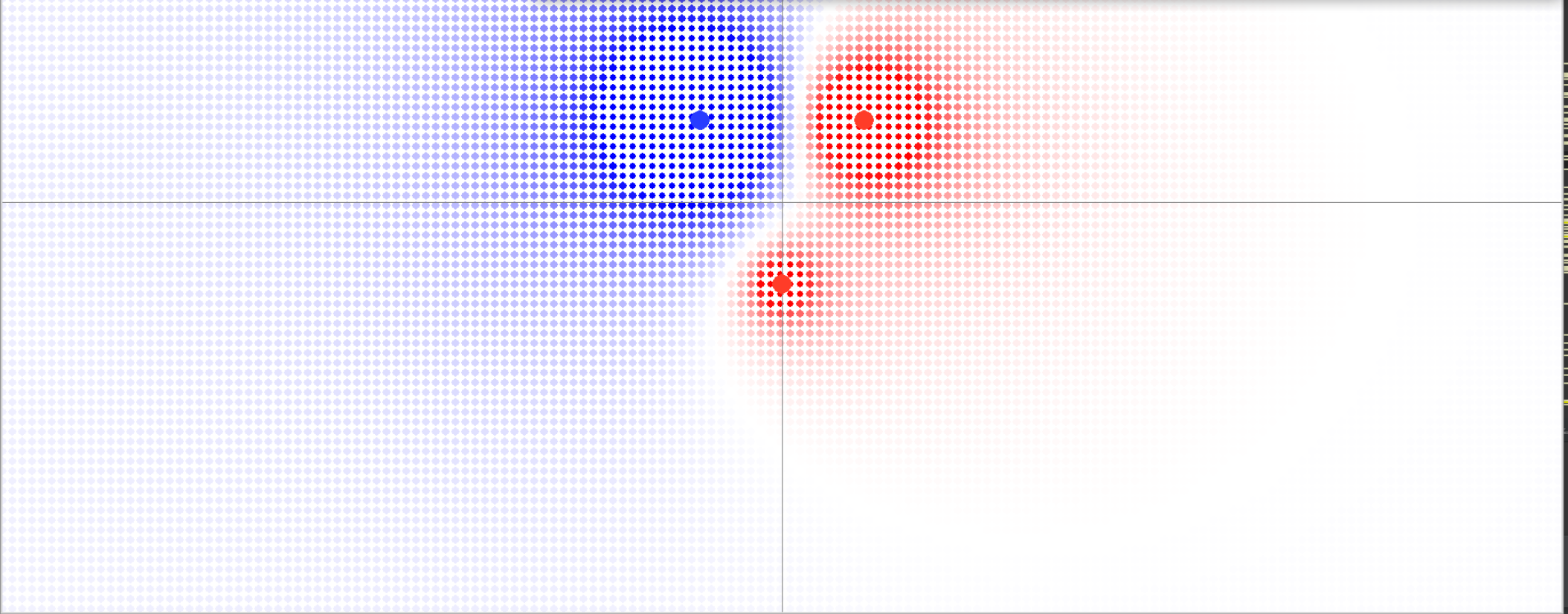
fps:0.45
x:5.38
y:2.36
Potential:40713.22
Intensity:[38085.90643832 27828.65]

SimPhysX - Electrostatic Fields

Editing the Space

Now you have 3 fields

Charge (C):	0.0001	ID:		ID:	0
Position x (m):	0	Charge (C):		ID:	3
Position y (m):	-1.0	Position x (m):		View info about the field	
		Position y (m):		q = 0.0003 C	
Create a new field		Edit the field		x = 1.0 m	
				y = 1.0 m	
				Delete the field	
				Clear the Space	



fps:4.88
x:4.63
y:2.47
Potential:0
Intensity:[0. 0.]

SimPhysX - Electrostatic Fields

Editing the Space

The space has been cleared

Charge (C):	<input type="text" value="0.0001"/>	ID:	<input type="text"/>	ID: 0
Position x (m):	<input type="text" value="0"/>	Charge (C):	<input type="text" value="3"/>	View info about the field
Position y (m):	<input type="text" value="-1.0"/>	Position x (m):	<input type="text"/>	
		Position y (m):	<input type="text"/>	

Create a new field

Edit the field

Delete the field

Clear the Space

q = 0.0003 C
x = 1.0 m
y = 1.0 m

Platform and Plugin Updates: PyCharm Community Edition is ready to update. (36 minutes ago)

Editing the Space

Untitled 1 - LibreOffice ...

SimPhysX - Electrostatic Fields

SimPhysX - [~/Yandex....

ScreenShots - File Man...

Inactive

10:11 LF: UTF-8+
Wednesday, February 21, 2018
07:42

Выводы

- Проект успешно развивается!