

History of Biostatistics or Biometry

Составитель –
доц.каф.молекулярной биологии и
генетики З.М. Бияшева

Самая смешная наука

- http://www.xs4all.nl/~jcdverha/scijokes/1_2.html#subindex
- <http://my.ilstu.edu/~gcramsey/Gallery.html>
- <http://davidmlane.com/hyperstat/humor.html>
- <http://www.gdargaud.net/Humor/QuotesScience.html#Statistics>

**Statistical
Humor**



- ❑ «There are three kinds of lies: lies, damned lies, and statistics».
Б. Дизраэли (1804-81)
- ❑ The average human has about one breast and one testicle
- ❑ 33.3% студенток Гарварда выходят замуж за профессоров
(из 3 одна вышла замуж за профессора)
- ❑ «If experimentation is the queen of the sciences, surely statistical methods must be regarded as the guardian of the royal virtue». М. Tribus
- ❑ «Statistics - servant of all science».
Jerzy Neyman. Science, 1955, Vol. 122, 3166, p. 401-406.

Прислуге всегда достается 😊

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Сайт «Биометрика» - автор и многолетний редактор В. П. Леонов: <http://www.biometrica.tomsk.ru/>

Анализ данных для диссертантов Семинары по биометрике

БИОМЕТРИКА - журнал для медиков и биологов, сторонников доказательной биомедицины

bio метрика BioMed Central The Open Access Publisher WebRing Creating Communities Connecting people

bio метрика Welcome to Source Code for Biology and Medicine bmj.com

Дисперсия жизни... Кликните по фотографии, и увидите логотип и тироль...

Java

Сайту 4309-й день.

Поиск в Google

Введите свой запрос

Если Ваш браузер не поддерживает JavaScript, пожалуйста, скачайте и установите Java. Если Вы используете браузер, поддерживающий JavaScript, пожалуйста, обновите его до последней версии.

bio метрика

С праздником 1 сентября!

Поздравляем читателей БИОМЕТРИКИ с началом учебного года!

В сентябре месяце 2010 г. стоимость диссертационного обучения у нас снижена на 25%.

Часть учебно-методических материалов сайта доступна только курсантам **системы дистанционного обучения**. На первом обучении они имеют возможность оперативной консультации и анализа статистических данных биомедицинского диагноза. Запрос на дистанционное обучение направьте на leo.biostat@gmail.com

Редактор БИОМЕТРИКИ В. П. Леонов

Анализ биомедицинских данных для диссертантов

Запрос Вашего успеха - работа с профессионалами! 20-летний опыт анализа данных в биологии и медицине доступен теперь и Вам!

УЧЕБНЫЕ И НАУЧНЫЕ РЕДАКЦИИ ПО БИОМЕТРИКЕ

1 2 3 4 5 6 7 8 9 10 11 12

КАРОВОСТАТИ И ФИНАНСОВАЯ СТАТИСТИКА

1 2 3 4

Воробьев К.П. в формате современной журнальной публикации по результатам клинического исследования

Часть 1. Сущность проблемы. Часть 2. Международные

Медведев потребовал выложить все диссертации в интернет

По словам главы государства, все диссертации и авторефераты должны быть выложены в интернет

Сайт президента России

Автореферат диссертации президента РФ Д.А. Медведева

Ресурсы: свободно-распространяемые программы

http://en.wikipedia.org/wiki/List_of_statistical_packages



The image shows a screenshot of the Wikipedia article "List of statistical packages". The page includes the Wikipedia logo, navigation links, and a list of statistical software packages. Two prominent advertisements are overlaid on the page: "WinSTAT" and "WinPepi PORTAL". A blue box highlights a quote from Abramson, J.H. regarding WinPEPI. A screenshot of the gretl software interface is also shown, with a caption identifying it as an open source statistical package.

WIKIPEDIA
The Free Encyclopedia

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List of statistical packages

From Wikipedia, the free encyclopedia

Statistical software are specialized computer programs for s

Contents [hide]

- 1 Open source
- 2 Public domain
- 3 Freeware
- 4 Proprietary
- 5 See also
- 6 References
- 7 External links

Open source

- **ADMB** – a software suite for non-linear st
- **Bayesian Filtering Library**
- **Chronux** – for neurobiological time series data
- **DAP** – A free replacement for SAS
- **ELKI** a software framework for development of data mining algorithms in Java.
- **Fityk** – nonlinear regression software (GUI and command line)
- **gretl** – gnu regression, econometrics and time-series Library
- **JAGS** – Just another Gibbs sampler (JAGS) is a program for analysis of Bayesian hierarchical models using Markov Chain Monte Carlo (MCMC) developed by Martyn Plummer. It is similar to WinBUGS.
- **JHepWork** – Java-based statistical analysis framework for scientists and engineers. It includes an advanced IDE and Jython shell.
- **JMulTi**
- **Octave** – programming language (very similar to Matlab) with statistical features
- **Mondrian (software)** - data analysis tool using interactive statistical graphics with a link to R.
- **OpenBUGS**
- **OpenEpi** – A web-based, open source, operating-independent series of programs for use in epidemiology and statistics based on JavaScript and HTML
- **OpenMx** – A package for Structural equation modeling running in R.
- **Orange**, a machine learning and bioinformatics software
- **Ploticus** – software for generating a variety of graphs from raw data
- **PSPP** – A free software replacement for SPSS

WinSTAT
the Statistics Add-In for Microsoft® Excel

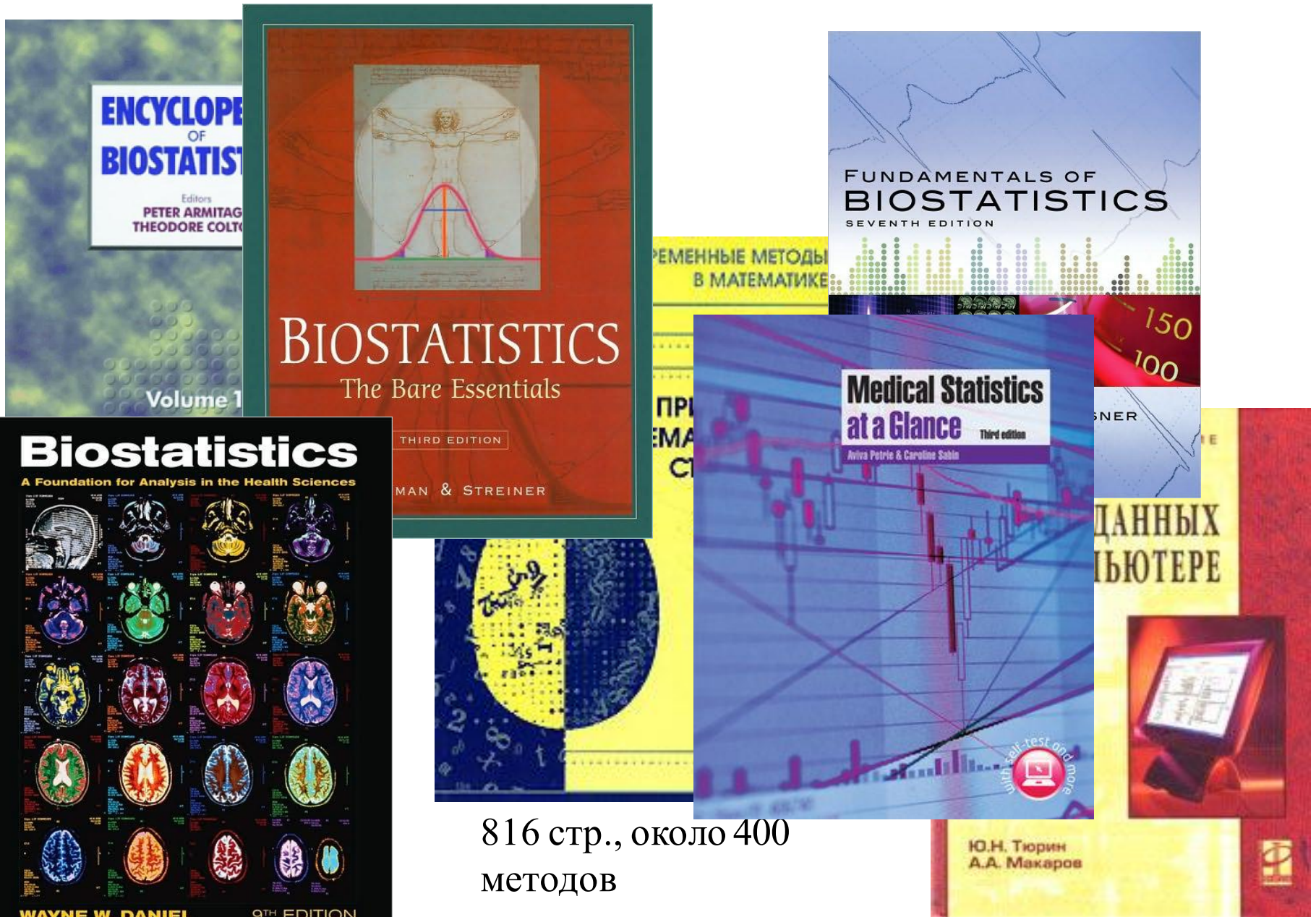
WinPepi PORTAL
Copyright J.H. Abramson, Jan. 9, 2010. Version 10.0

WINPEPI **PEPI**

Abramson, J.H. WINPEPI updated: computer programs for epidemiologists, and their teaching potential. Epidemiologic Perspectives & Innovations 2011, 8:1

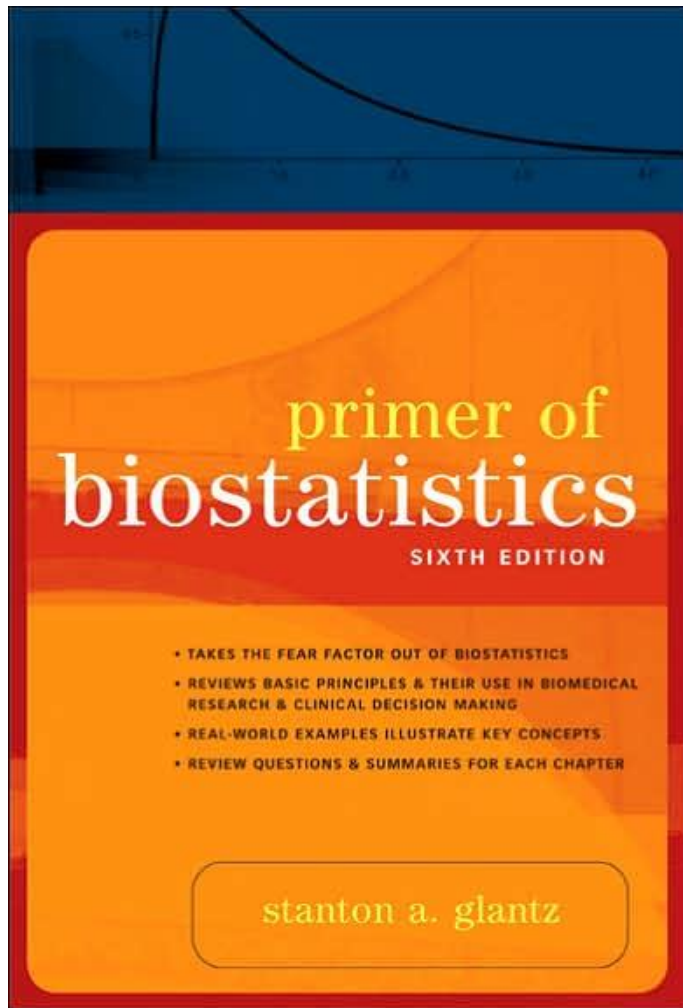
gretl is an example of an open source statistical package

Ресурсы: книги (можно скачать с моего компьютера)



816 стр., около 400
методов

Букварь по биостатистике



S. Glantz,
Primer of Biostatistics
6 edition, McGraw-Hill,
2005, 500 pp.

Стентон Гланц
Медико-биологическая
СТАТИСТИКА

Перевод с английского
доктора физ.-мат. наук
Ю. А. Данилова
под редакцией
Н. Е. Бузюкшвили
и Д. В. Самойлова

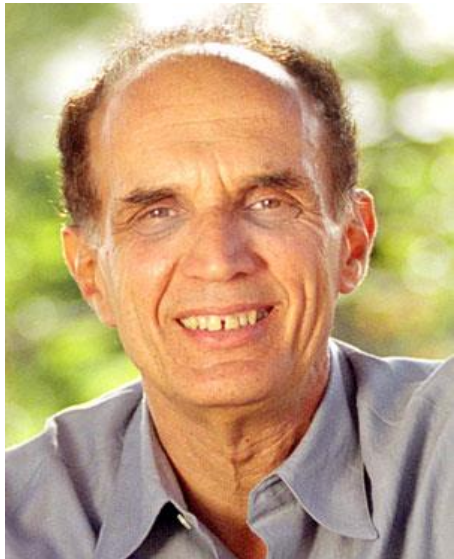

п р а к т и к а
Москва 1999

Русский перевод доктора физ.-мат. наук
Ю. А. Данилова
Доступен в Интернете!

Два авторитетных противоположных мнения



Если для Вашего эксперимента требуется статистика, то Вы должны переделать его более тщательно
(Эрнест Резерфорд)



Те, кто игнорируют статистику, обречены изобрести ее заново
(Бредли Эфрон).

Timeline of biostatistics

1687 y.	Isaac Newton book <i>Philosophiæ Naturalis Principia Mathematica</i>
1801 y.	<u>Gauss</u> predicts the orbit of Ceres using a line of best fit
1814 y.	<u>Laplace's</u> <i>Essai philosophique sur les probabilités</i> defends a definition of probabilities in terms of equally possible cases
1888 y.	<u>Galton</u> introduces the concept of correlation
1908 y.	Student's t-distribution for the mean of small samples published in English
1919 y.	<u>Fisher</u> he developed the analysis of variance (ANOVA)
1925 y.	Karl Pearson the correlation coefficient
1935 y.	<u>R. A. Fisher's</u> <i>Design of Experiments</i> (1st ed)
1937 y.	<u>Neyman</u> introduces the concept of confidence interval in statistical testing

Isaac Newton (1642 – 1726/27)

- most influential scientists
- His book *Philosophiæ Naturalis Principia Mathematica* in 1687
- Newton's *Principia* formulated the laws of motion and universal gravitation



Calculus

- Started developing Calculus as early as 1666 but never really got around to publishing much
- In about 1668, Wilhelm Leibniz began developing very similar ideas and published them before Newton's published his work
- Arguing ensued
- (Leibniz used dy/dx notation; Newton used \dot{y})



The Development of Biostatistics or Biometry

John Graunt (1620-1674) and William Petty (1623-1687) were early students of vital statistics. This subject also became known as political arithmetic. Taxes and insurance caused people to become interested in problems of censuses (*перепись*), longevity (*долголетие*) and mortality, in future - morbidity.

Blaise Pascal (1623-1662) and Pierre de Fermat (1601-1665) – Frenchmen. **Jacques Bernoulli (1654-1705)**, a Swiss, laid the foundation of modern probability theory in ***Ars Conjectandi*** (искусство предположения).

Abraham de Moivre (1667-1754), a frenchman living in England, was the first to combine the statistics of his day with probability theory.

Pierre-Simon Laplace

- 23 March 1749 – 5 March 1827
- was an influential French scholar whose work was important to the development of mathematics, statistics, physics, and astronomy.
- Laplace's *Essai philosophique sur les probabilités* defends a definition of probabilities in terms of equally possible cases



Johann Carl Friedrich Gauss

- 30 April 1777 – 23 February 1855
- was a German mathematician who contributed significantly to many fields including
- number theory, algebra, statistics, analysis, differential geometry, geodesy, geophysics, mechanics, electrostatics, astronomy, matrix theory, and optics.
- introduced the median,
- re-discovered the normal distribution.



Works

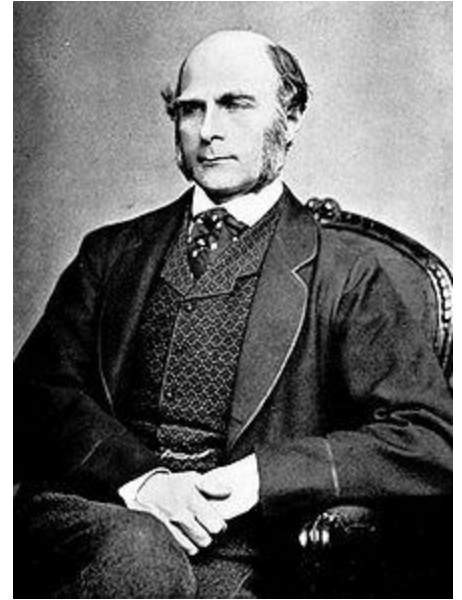
- 1)Arithmetic Series
- 2)Fundamental theorem of algebra
- 3)Last square fitting
- 4)Parallel Postulate
- 5)Non-Euclidean Geometry
- 6)Cauchy integral INDEX

Adolphe Quetelet (1796-1874) , a Belgisn astronomer and mathematician. Who in his work combined the theory and practical methods of statistics and applied them to problems of biology, medicine. And socioligy.

16 February 1822 – 17 January 1911 was an English Victorian statistician, progressive, polymath, sociologist etc. A cousin of Charles Darwin, has been called the farther of biostatistics and eugenics (евгеника)

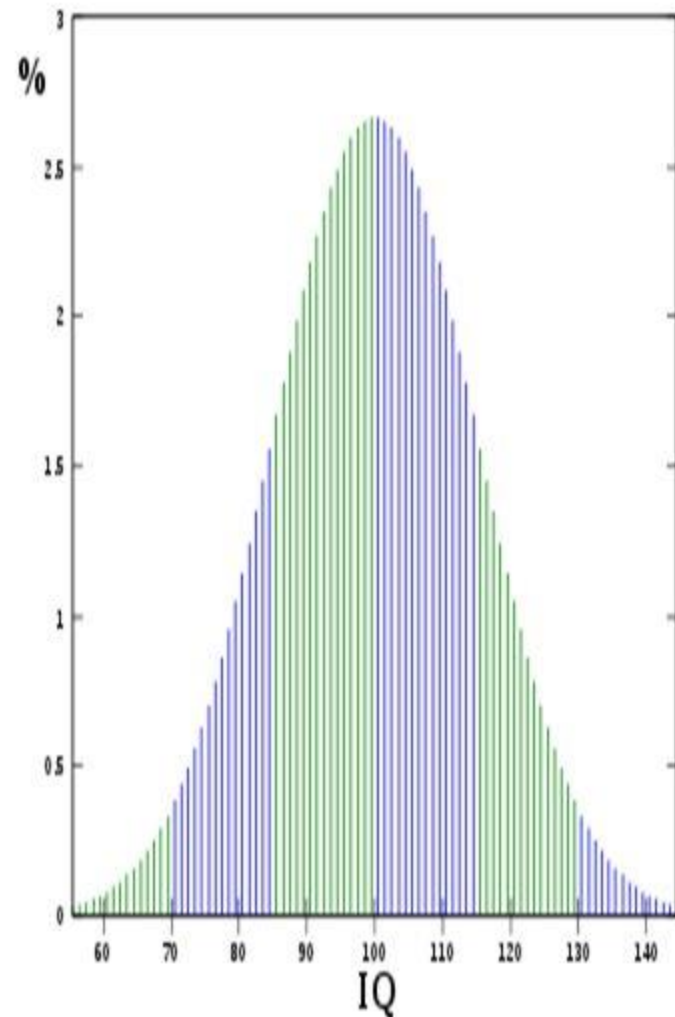
Francis Galton

- produced over 340 papers and books.
- He also created the statistical concept of correlation
- widely promoted regression toward the mean.
- He was the first to apply statistical methods to the study of human differences and inheritance of intelligence,
- introduced the use of questionnaires and surveys for collecting data on human communities, which he needed for genealogical and biographical works and for his anthropometric studies.



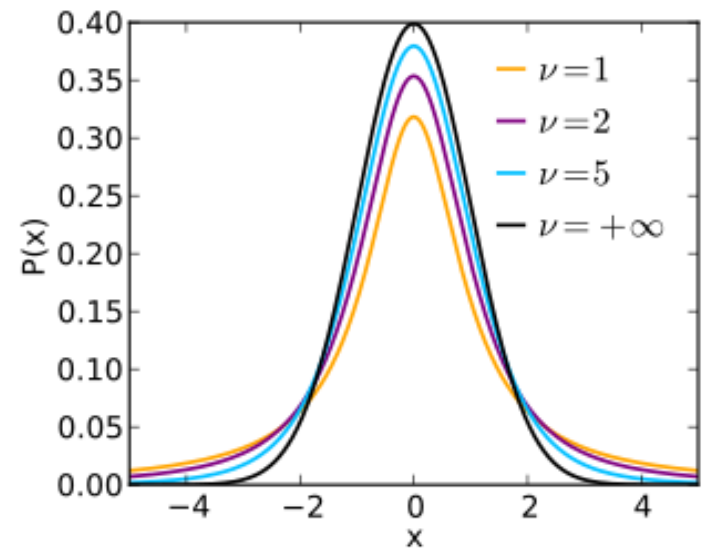
Testing and Individual Differences- Francis Galton

- Francis Galton-
interested in **statistics**
and developed the
statistical concept of
correlation and was the
first to demonstrate
that the normal
distribution could be
applied to **intelligence**.



Student's t -distribution

- is any member of a family of continuous probability distributions that arises when estimating the mean of a normally distributed population in situations where the sample size is small and population standard deviation is unknown.
- It was developed by William Sealy Gosset under the pseudonym *Student*



Karl Pearson (1857-1936)

- introduced the mode,
- mean deviation,
- coefficient of variation,
- moments,
- measures of symmetry and kurtosis,
- the chi-square,
- symbol of the null hypothesis (H_0),
- type 1 and type 11 errors,
- homoscedacity and heteroscedacity, and
- the concept of partial correlation.



Ronald Fisher (1890-1962)

- introduced variance,
- methods for small samples,
- factorial designs,
- the null hypothesis,
- random allocation,
- ANOVA,
- ANCOVA,
- relation between regression and ANOVA, and testing significance of the regression coefficient.



- Ronald Fisher developed several basic statistical methods in support of his work studying the field experiments at Rothamsted Research,
- including in his 1930 book *The Genetical Theory of Natural Selection*
- Sewall G. Wright developed F-statistics and methods of computing them
- J. B. S. Haldane's book, *The Causes of Evolution*, reestablished natural selection as the premier mechanism of evolution by explaining it in terms of the mathematical consequences of Mendelian genetics.



Jerzy Neyman

- April 16, 1894 – August 5, 1981
- He published many books dealing with experiments and statistics
- Neyman proposed and studied randomized experiments in 1923
- He introduced the confidence interval in his paper in 1937.
Another noted contribution is the Neyman–Pearson lemma, the basis of hypothesis testing.



References:

- <http://omarkasule-03.tripod.com/id843.html>
- <https://en.wikipedia.org/wiki>
- <http://onlinelibrary.wiley.com/doi/10.1002/0470011815.b2a17065/abstract>
- <http://www.biostatistics.vcu.edu/history/>