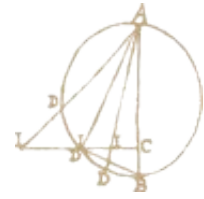
Collective Biographies - the Database BBI - Biographical Background Information

Wolfgang Karl Härdle, Chen Huang
Andrija Mihoci, Alla Petukhina
Annette B. Vogt



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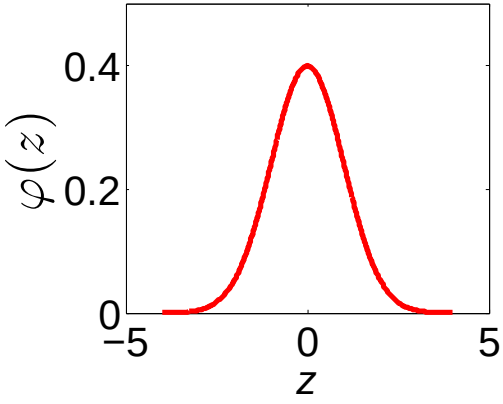
Carl Friedrich Gauss

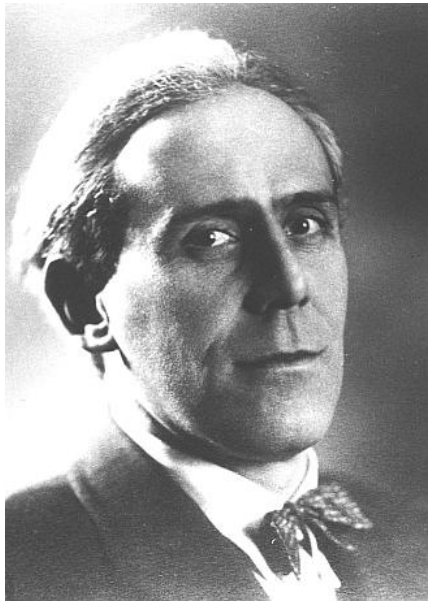
1777–1855



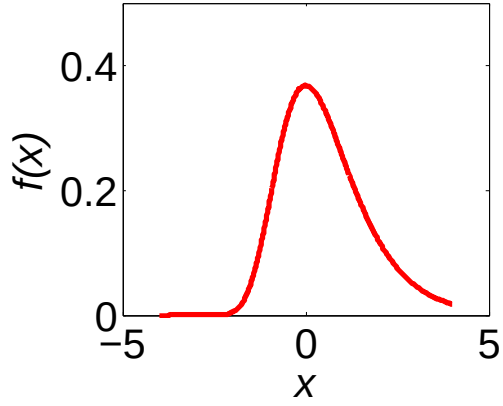
$$\varphi(z) = \frac{1}{\sqrt{2\pi}} \exp\left\{-\frac{1}{2}z^2\right\}$$ norm

Carl Friedrich Gauss on BBI:

Emil Julius Gumbel

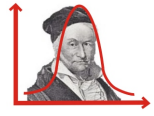


1891–1966

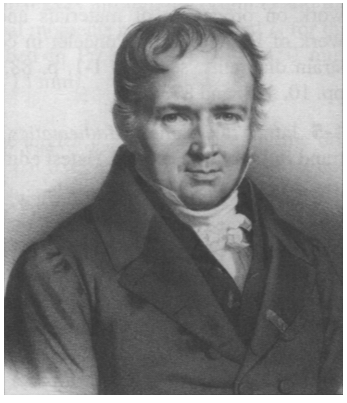


$$f(x) = \exp\left[-\left\{x + \exp\left(-x\right)\right\}\right]$$

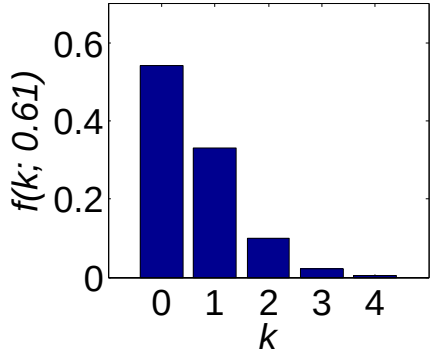
Emil Julius Gumbel on BBI: 



Siméon Poisson, Ladislaus von Bortkiewicz



1781-1840



$$f\left(k;\lambda\right) = \exp\left\{-\lambda\right\}\frac{\lambda^k}{k!}$$

1868-1931

Siméon Denis Poisson and Ladislaus von Bortkiewicz on BBI:

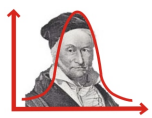
BBI

(i) Database - Biographic Information
- Scientists, structure and interface
- Criteria and principles, academic contributions

(ii) Research and Teaching
- Selected biographies of statisticians and mathematicians
- BBI in practice: projects and courses

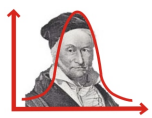
Outline

1. Motivation ✓
2. BBI Project
3. Selected Biographies
4. BBI in Practice
5. Conclusions



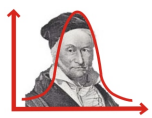
BBI Structure

- 116 biographies ▸ Alphabetical / Time index
  - Biographical information and photo, education, career path
  - Academic contribution, important publications, network building
- Μήτις knowledge database ▸ Link



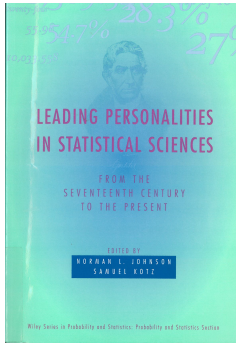
Criteria and principles

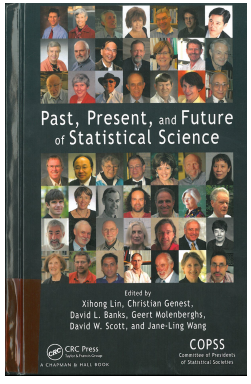
- Academic Contributions
  - Mathematics
  - Mathematical statistics
  - Various fields of statistics, e.g. financial statistics

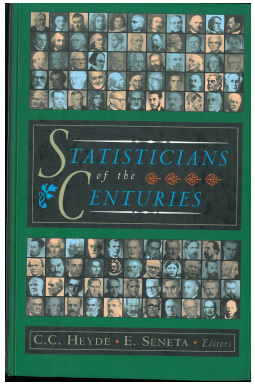


Sources

- Dictionaries and enciclopedias
- Archives
  - Uppsala
  - Amsterdam
  - Berlin







Ladislaus von Bortkiewicz

Biography

Ladislaw Josephowitsch Bortkiewitsch

7 Aug. 1868 St Petersburg - 15 July 1931 Berlin

Wladimir Savelyevich Woytinsky

Biography

Vladimir S. Vojtinskij

12 Nov. 1885 St. Petersburg - 11 June 1960 Washington

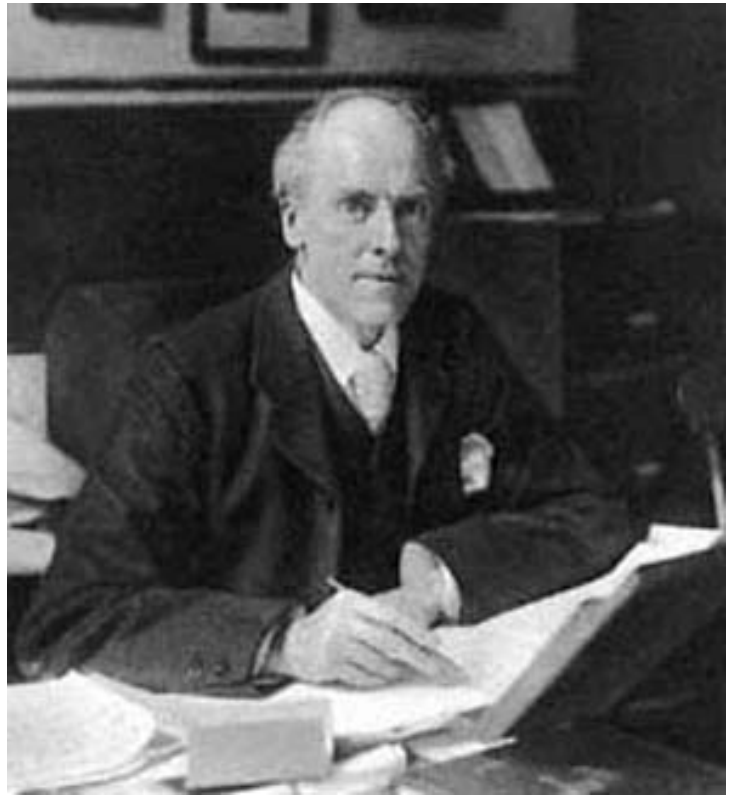
Ernst Wagemann

Biography

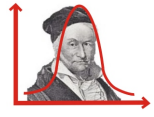
18 Febr. 1884 Chanarcillo - 20 March 1956 Bad Godesberg

Karl Pearson

Biography

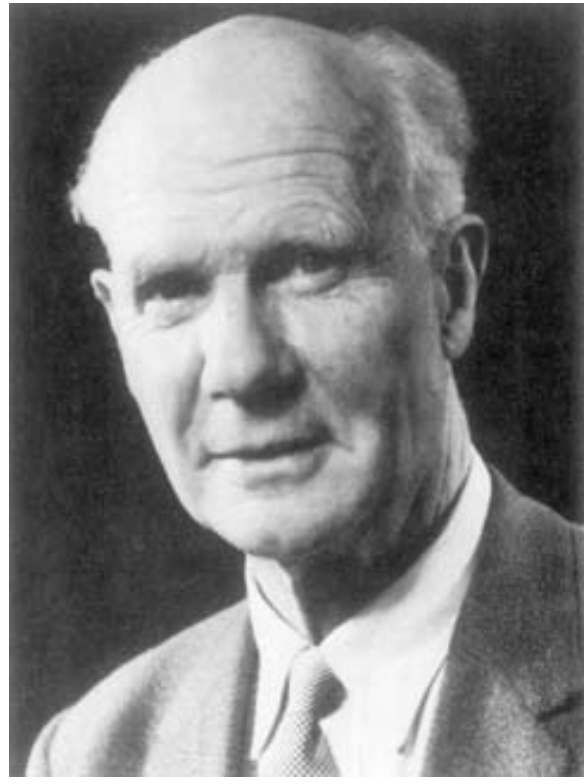


27 March 1857 London - 27 April 1936 Coldharbour Surrey



Egon Pearson

▸ Biography



11 Aug. 1895 Hamstead - 12 June 1980 Sussex

Hermann Otto Hirschfeld ▸ Biography

Hermann Otto Hartley

13 April 1912 Berlin - 30 Dec. 1980 Durham

BBI in Practice

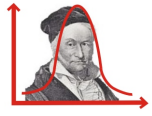
Definition

Let $(\mathcal{X}, d)$ be a metric space. It is called

- **complete** iff any Cauchy-sequence converges in $\mathcal{X}$. (this is clear in $\mathbb{R}^n$, in $\mathbb{Q}^n$ not complete).
- a **Hilbert space** iff its linear and complete and (usually) infinite-dimensional.
- a **Banach space** if the normed space is complete.

David Hilbert, Stefan Banach and The Scottish Café on BBI: 

Advanced Mathematics - Topology and Convex Optimization



BBI in Practice

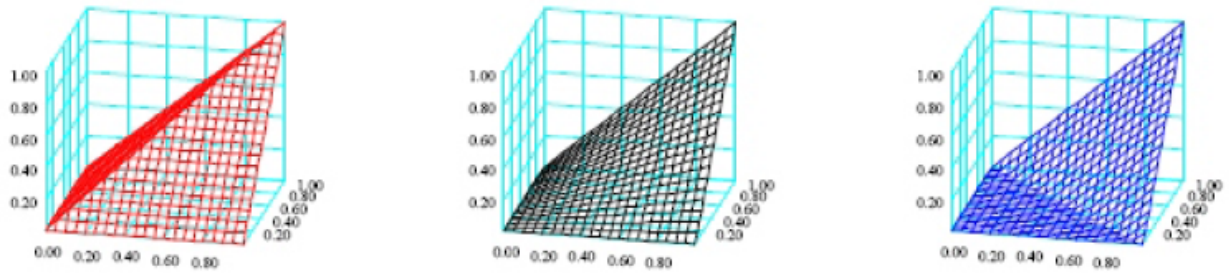
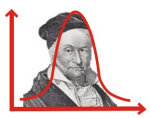


Figure 9.2: Fréchet-Hoeffding upper bound $M(u_1, u_2)$ (left), product copula $\Pi(u_1, u_2)$ (middle), Fréchet-Hoeffding lower bound $W(u_1, u_2)$ (right).

Wassily Hoeffding and *Maurice R. Fréchet* on BBI: 

Advanced Methods in Quantitative Finance - Modeling Dependencies with Copulae



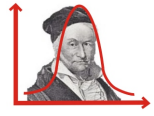
BBI in Practice

Cornish-Fisher Expansion

- CF Expansion (1938): approximation of an α-quantile of any distribution, F, with an α-quantile of standard normal distribution, Φ.
- Apply
  - Lagrange Inversion Theorem - step 1
  - Gram-Charlier Series Expansion - step 2

Joseph Louis Lagrange, *Jørgen Pedersen Gram and Carl Charlier* on BBI: 

Metis knowledge database - Bahadur Representation, Edgeworth Expansion and Cornish-Fisher Expansion



BBI in Practice

1. Exponential-ACD, Engle and Russel (1998) ▸ EACD

   $\varepsilon_i \sim Exp(1)$, $\boldsymbol{\theta}_E = (\omega, \boldsymbol{\alpha}, \boldsymbol{\beta})^\top$, $\boldsymbol{\alpha} = (\alpha_1, \ldots, \alpha_p)$, $\boldsymbol{\beta} = (\beta_1, \ldots, \beta_q)$

2. Weibull-ACD, Engle and Russel (1998) ▸ WACD

   $\varepsilon_i \sim \mathcal{G}(s, 1)$, $\boldsymbol{\theta}_W = (\omega, \boldsymbol{\alpha}, \boldsymbol{\beta}, s)^\top$

Robert F. Engle and Waloddi E.H. Weibull on BBI: 

Härdle et al. (2014) *Local Adaptive Multiplicative Error Models for High-Frequency Forecasts*

Conclusions

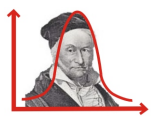
(i) Database - Biographic Information

- Better and deeper understanding the history of our field
- Constructed by many colleagues, advanced collaboration on an open-end-project
- Gives impulses to think on historical roots, or influences of the development until recent days

Conclusions

(ii) Research and Teaching

- Selected biographies of statisticians and mathematicians
- Examples of usefulness in teaching and research - it helps to present results



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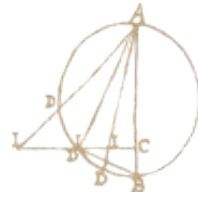

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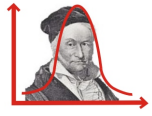
Education

- He studied law in St Petersburg, then political economy and statistics at the universities in Strassburg (today Strasbourg), Göttingen, Vienna and Leipzig
- He received a doctoral degree in 1893 at the University of Göttingen under Wilhelm Lexis
- In 1895 he became Privatdozent after the Habilitation at the University of Strassburg under Georg Friedrich Knapp

▸ Selected biographies



Career Path

- From 1897 to 1901 he was working in a railway office in St Petersburg and was teaching at the Alexandrovsky Lyceum
- He became außerordentlicher professor at the University of Berlin in 1901; in 1920 he became full professor (ad personam)
- From 1906 to 1923 he also taught at the Berlin School of Economics (Handels-Hochschule)

▸ Selected biographies

Academic Contribution

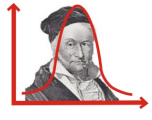
- Mathematical statistics and applications to actuarial science (Prussian horse-kick data) and political economy (Marx's theory on profit and prices)
- He discovered that events with low frequency in a large population follow a Poisson distribution
- Editor of the 7 volumes "Die Welt in Zahlen" by Wladimir Woytinsky published between 1925 and 1928 in Berlin

▸ Selected biographies

Important Publications

- Die mittlere Lebensdauer, Jena, 1893
- Das Gesetz der kleinen Zahlen, Leipzig, 1898
- Wertrechnung und Preisrechnung im Marxschen System, Archiv für Sozialwissenschaft und Sozialpolitik, 1907
- Die radioaktive Strahlung als Gegenstand wahrscheinlichkeitstheoretischer Untersuchungen, Berlin, 1913
- Die Iterationen, Berlin, 1917

▸ Selected biographies



Education and Career Path

- He studied law at the University St. Petersburg, as student he participated in the Russian revolution in 1905
- From 1908 to 1912 he was in prison, from 1912 to 1917 he was in exile in Siberia because of this political activities against the Russian Imperator; in exile he studied economic literature

▸ Selected biographies

Career Path

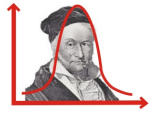
- In 1917 he participated in the February Revolution in Russia, from 1918 to 1922 he was working for the social democratic government in Georgia
- From 1922 to 1933 he was an emigrant in Germany, from 1933 to 1935 in France; since 1935 he and his wife and collaborator Emma S. Woytinsky (1893 Witebsk - 1968 Washington) were living in the USA

▸ Selected biographies

Career Path

- In Berlin Wladimir and Emma Woytinsky were working together on a project of popularization of statistics (published from 1925 to 1928) and came in contact with Ladislaus von Bortkiewicz who became their private teacher and editor of these volumes
- From 1929 to 1933 he became the director of the small statistical department of the central trade union organization (ADGB), one of his collaborator was Bruno Gleitze

▸ Selected biographies



Career Path

- In the USA he was working for the Central Statistical Board, from 1942 to 1947 for the Social Security Board, and later for different government institutions
- Wladimir and Emma Woytinsky published together three books, in 1943 on employement in the USA, 1953 *World Population and Production*, and 1959 *Lessons of the Recessions*

▸ Selected biographies

Academic Contribution

- Between 1925 and 1928 he published 7 volumes *The World in Figures* (Die Welt in Zahlen) in Berlin, edited by Ladislaus von Bortkiewicz
- In January 1932 he propagated the WTB plan against recession because of the economic crisis, together with Fritz Tarnow (1880-1951) and Fritz Baade (1893-1974)

▸ Selected biographies

Academic Contribution

- He was one of the most famous expert on the policy of *New Deal*
- His autobiography *Stormy Passage: A Personal History Through Two Russian Revolutions to Democracy and Freedom: 1905-1960* was published in New York in 1961; her autobiography *Two Lives in One* came out in 1965

▸ Selected biographies

Education and Career Path

- He attended the German School in Valparaiso, then he came to the high school in Lüneburg
- After his studies of economy and political sciences in Göttingen, Berlin and Heidelberg he received a doctoral degree in 1907
- From 1908 to 1910 he was a lecturer at the Hamburg Colonial Institute
- From 1911 to 1913 he traveled to South America

▸ Selected biographies

Career Path

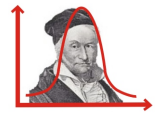
- He finished his Habilitation in 1914 at the University of Berlin
- In 1919 he became außerordentlicher professor at Berlin University and worked at the Prussian Ministry
- From 1923 to 1933 he was director of the Prussian Statistical Office; he was teaching at the University of Berlin, and he was the director of the newly Institute for business cycles

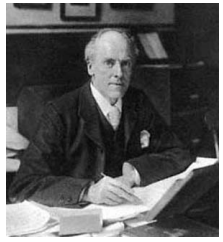
▸ Selected biographies

Academic Contribution

- In 1932 he suggested the "Wagemann Plan" to combat the economic crisis, in contradiction to the "WTB-Plan" by Wladimir Woytinsky, and Fritz Tarnow, and Fritz Baade
- From 1945 to 1949 he was living in Chile, where he founded the "Instituto de Economia" in 1948
- Wagemann influenced the modern business statistics in Germany

▸ Selected biographies

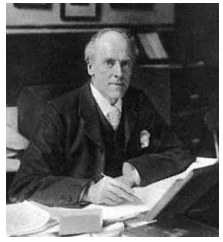




Education and Career Path

- He studied mathematics, German literature (in Heidelberg and Berlin) and law
- He established the Department of Applied Statistics at the University of London and held a chair in eugenics
- Father of Egon Pearson

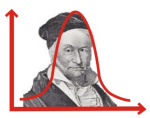
▸ Selected biographies

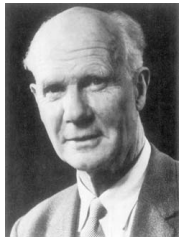


Academic Contribution

- Co-founder of the journal *Biometrika*, and its editor until his death
- Pearson's correlation coefficient
- Classification of distributions
- Pearson's chi-square test

▸ Selected biographies

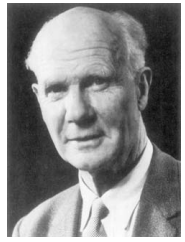




Education and Career Path

- Son of Karl Pearson
- He studied solar physics, but became involved in statistics
- Joined his father's Department of Applied Statistics at University College London
- Became managing editor of the journal *Biometrika* after his father's death

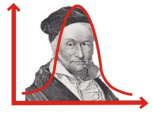
▸ Selected biographies

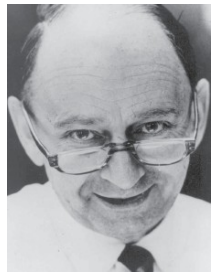


Academic Contribution

- Neyman-Pearson lemma of statistical hypothesis testing
- Together with Hermann O. Hirschfeld he published two volumes of *"Tables for Biometricians Statisticians"* in 1954 and 1972, which became a standard publication until the late 1970s

▸ Selected biographies

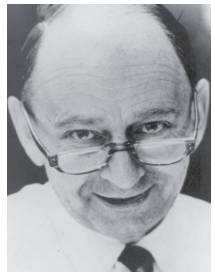




Education and Career Path

- He studied mathematics at the universities in Göttingen and Berlin
- He received the doctoral degree in 1934 at the Berlin University
- Because of the Nazi regime he emigrated to England in 1934, where he worked under John Wishart at the Cambridge University

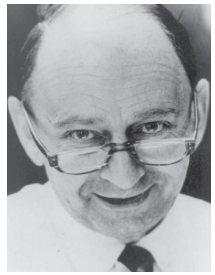
▸ Selected biographies



Career Path

- In England he changed his surname to Hartley; he married and the couple raised two children
- In 1953 he moved to the USA
- Statistician at Harper Adams Agriculture College, Shropshire from 1936 to 1938
- From 1938 onwards he was part of the Scientific Computing Services team, collaborating with Egon Pearson

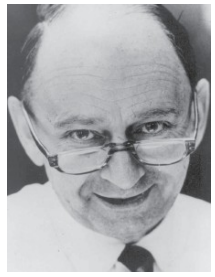
▸ Selected biographies



Career Path

- Lecturer in Statistics at University College London in 1946
- Professor at Iowa State College in 1953
- Professor at Texas A&M in 1964
- Duke University; National Testing Service

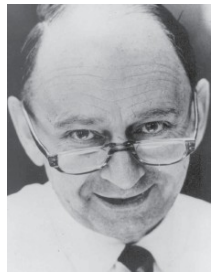
▸ Selected biographies



Academic Contribution

- During the World War II he was involved in army research in the team of the Scientific Computing Services
- He was one of the founders of the Texas A&M University's Institute of Statistics
- Together with Egon Pearson he published two volumes of *"Tables for Biometricians Statisticians"* in 1954 and 1972, which became a standard publication until the late 1970s

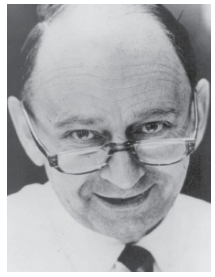
▸ Selected biographies



Important Publications

- Biometrika Tables for Statisticians, vol. 1., 1954, with Egon Pearson
- Unbiased ratio estimators, 1954, with Rao, J.N.K.
- Biometrika Tables for Statisticians, vol. 2., 1972, with Egon Pearson

Selected biographies

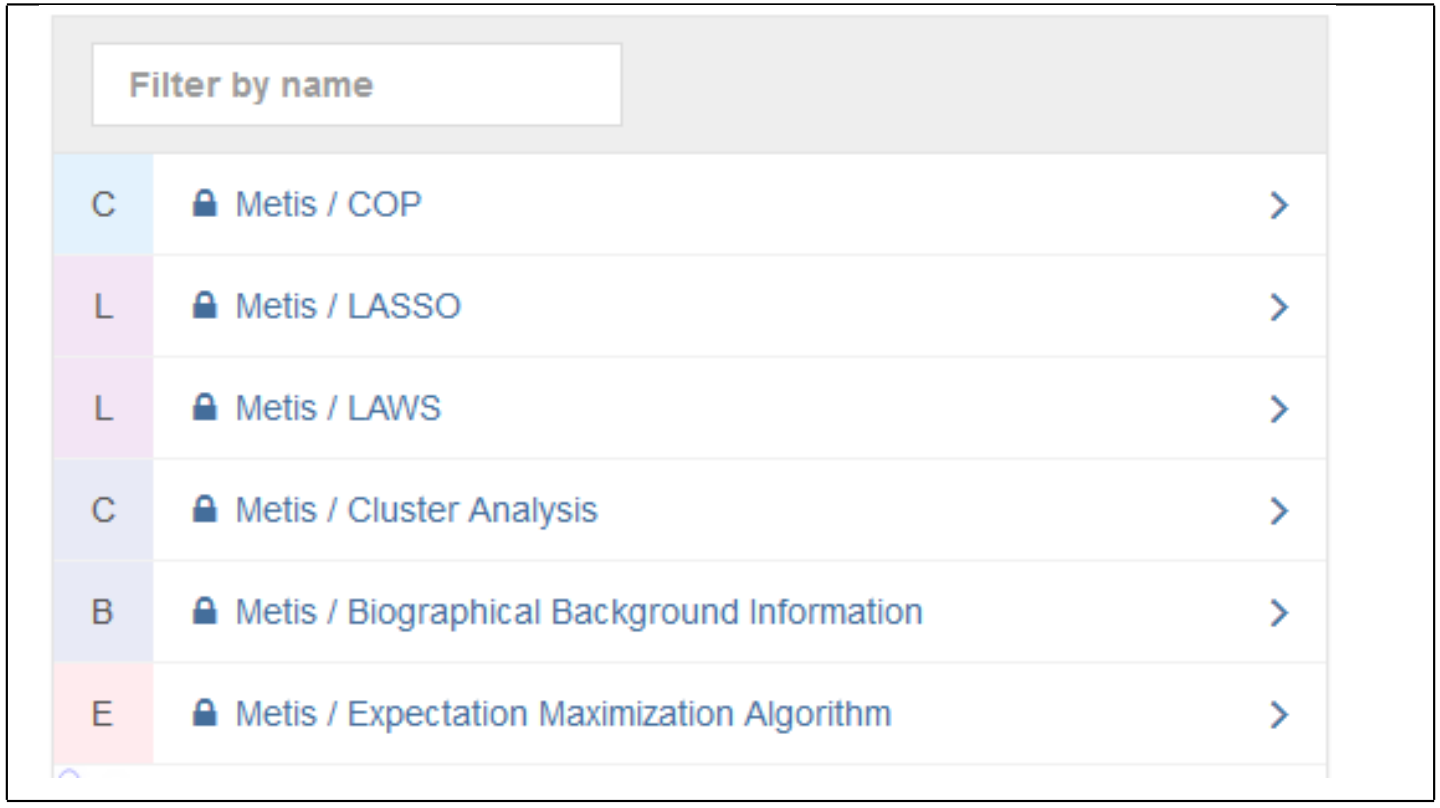


Important Publications

- The impact of computers on statistic, 1976
- Estimation of nonsampling variance components in sample surveys, 1978, with Rao, J.N.K.

▸ Selected biographies

Μήτις Knowledge Database ▸ BBI Project



Ladislaus von Borkiewicz Chair of Statisics - Miscellaneous (link)

Biographical Background Information

▸ BBI Project

Surname: A-F, G-J, K-N, P-T, U-W

Year of Birth