K S PRAHARSHIT SHARMA +91 7416 03 2787
+91 96 25 14 80 79 (WhatsAPP Messaging Number)

SHARMAJI @ ISCB . ORG DOB- **5th March, 1988**
spraharshit@gmail.com praharshit1@mail.com AGE: 38 years

https://www.linktr.ee/Bio.Informatics compbio.iiitd@gmail.com

https://www.itsoc.org/profile/9590
SKYPE: praharshit.sharma
Correspond : KSP SHARMA, s/o DR K HARIPRASAD, F-104, DOOR NR. 6/ 188 - 2,
RS RESIDENCY, PAPPULA STREET, STONEHOUSPET, OPPOSITE WATERTANK, NEAR
SC BOSE PARK, SPSR SRI POTTI SRIRAMULU NELLORE- 524 002 Andhra Pradesh (INDIA).

SUMMARY: Strong **BIOINFORMATICS** Professional Open to Full-time positions in Academia| Industry| Research & Development| Startups possessing **15+** years Europe-India-South Africa Global Work Experience, inclusive of Internships at SAIL-VISP, CSIR-IICT, BioCOS Bengaluru, and NSS + BITS Embryo Leadership.

SKILLSET: LINUX (fish-Shell | bash,grep,awk,sed); MySQL, Python3, cran-R/ Bio-conductor, C/C++/C#, Octave/ Mathematica, Data Science – ML/ DL/ NLP/ AI/ BDA, NGS data Analysis (WGS/ WES, FastQC, SNP-calling/, (sc)RNA-seq, ChIP-seq, deNovo Genome/Transcriptome Assembly, Metagenomics, **BLAST**, HiC, BS-seq).
Familiar: NextFlow, Google CoLab, Git/GitHub, Taverna, NCBI-Edirect/E-bot,BioConda,Bio-DB, AWS EC2 – S3)

EXPERIENCE: Served as BIOINFORMATICS SPECIALIST (Rs. 75,000/- PM) at NCDC, DGHS, MoH&FW Delhi

Quantum Computing Institute, Cape Town, South Africa	Associate Researcher	01-July-2022	- PRESENT **(Y2Q) ~ 2029**	**www.qcict.org/index.php?p=about**
Jaipur National University	Assistant Professor	7-Feb-2022	22-Jun-2022	Docent UG Bioinformatics Sophomores
ICAR-NIVEDI, Yelahanka	Sr. Research Fellow	22-Mar-2021	30-Sep-2021	NADCP, FMD - BRUCELLOSIS
IIIT Allahabad, UP, India	Data Analyst	1-Aug-2020	12-Mar-2021	DBT – Genome India Project
ICAR NAARM Hyderabad	DBTBIF Traineeship	24-Apr-2019	23-Apr-2020	Skill-BIF **on** Agri - Biotechnology
BGDSIC , MSME-D, **GoI**	**Managing Director**	2-Apr 2018	31 Mar 2019	**www.freelancer.in/u/kspsharma**
ArrayGen Technology Pune	Global BD Manager	1-Jun 2017	31-Mar-2018	Clientele Nigeria, Kuwait, Ghana
Thrombosis Institute, India	Senior Res. Fellow	2-Nov-2016	31-May 2017	https://simtk.org/projects/tricfd
POLISH AIRFORCE	NOBELprize Nominee	2nd JAN-2014	**TILL-DATE**	Genetic-code Superinformation NEPITization
CSIR-CCMB Hyderabad	Project Fellow 8676	1-Apr-2014	19-Feb-2015	MicroRNA Gene Interactomics
BioServe/ CGI Hyderabad	DBT BCIL Trainee	18-Oct-2013	31-Mar-2014	NGS data Analysis Pipelines
BioClues, Denmark (EU)	AP state Volunteer	1-Aug-2012	31-Aug-2013	https://bioclues.org/bifx-for-schools/

EDUCATIONAL QUALIFICATIONS:

University/School	**Qualification**	**Subject/Department**	**Grade/ Board**	**Duration**
SggW-WULS Poland BioSB, Netherlands	Doctorate Mobility Erasmus Mundus	Bio-Technology, USC-Spain Funded	8.904 / 10 (**ECTS**)	2015 – 2016
IBAB-SMU Karnataka	M.Sc , PG Diploma	Bioinformatics	66.69 % (**UGC**)	2011 – 2013
BITS Pilani, RAJ	Integrated MSc(Hons)	Chemistry	6.91 / 10 (**AICTE**)	2005 – 2011
DAV-BHEL, TN	High School	PCM, Comp. Science	87.8 % (**CBSE**)	1991 – 2005

PUBLICATIONS: 7 Pre-prints **{CH}** https://zenodo.org/search?q=Praharshit&l=list&p=1&s=10&sort=bestmatch
18+ Original works **(UK)** https://f1000research.com/search?q=Praharshit **OrCiD** https://orcid.org/0000-0002-8747-0667
GitHub [USA]https://github.com/bioinformer **Hirsch-index = 1 ,** Google Scholar. **IIT Khagarpur NDL-**
https://ndl.iitkgp.ac.in/re_search?key=Praharshit INFLIBNET- https://vidwan.inflibnet.ac.in/profile/90463

Certifications: PadhAI (OneFourth-Labs, IIT Madras), SWAYAM-NPTEL, DataCamp, UpGrad Free-Courses, Scaler-MasterClasses, Various FDPs: Faculty Development Programs, BioStar-Handbooks Practice, NGS analysis Workshops.

COVER-LETTER

PRAHARSHIT SHARMA is a NOBEL Prize Nominee , as decreed by the Polish Airforce for over a Decade now since Initial Nomination for the coveted NOBEL Prize https://zenodo.org/records/4474304

Currently, and Regularly, Praharshit Sharma has been engaged in Organizing as well as Carrying out various Online BIOINFORMATICS Workshops including but not restricted to NGS data Analysis, Genomic Data Science and also On-site Computational Biology, Biostatistics, Chemo-informatics, CADD/ Computer-Aided Drug Discovery, Agricultural + Marine + Clinical Bioinformatics Workshops as a Formidable Resource person, BOTH Nationally (within India) as well as Internationally. Praharshit Sharma is well-Networked Professionally, and happens to be a Topper in ALL-India Competitive Examinations such as GATE, ICAR-AICE(SRF) and NIPER-JEE. Below are duly mentioned "2" of Praharshit Sharma's Educational Pedagogy initiatives, that has attracted Global Attention:

***BISCUIT= Bioinformatics Involvement of Schools & Colleges Utilizing Information Technology.**
***CHOCOLATE = CHemOinformatiCs Online Learning, Academics, Training and Education.**

BISCUIT gestated in the Oldest University of Italy (1386 Estd. University of Camerino) and was presented to a wider Audience at India's Largest Annual Biotechnology Event, Bangalore-India-Bio in Feb, 2016. (https://bioinfobitsian.wixsite.com/biscuitglobal)

PRAHARSHIT SHARMA has 46+ International and National BIOINFORMATICS Conference Proceedings, inclusive of Bioinformatics Workshop Participation to his Credit, a Representative of Whom is enlisted @ (http://www.bit.ly/bioinfoworks).

Sharmaji is a Member of Reputed International Learned Societies as follows =

Life Member [1268] Indian Bio-Physical Society (SINP, Kolkata and TIFR, Mumbai)

Member [27309] ISCB, Inter-National Society for Computational Biology, USA

Life Member, BioClues (India's Largest BIOINFORMATICS Society, regd. in Denmark) Affiliate of Asia-Pacific Bioinformatics Network Singapore

Member, EMBNET (European Molecular Biology NETwork, UK)- OLDEST Bioinformatics Society in the Whole World)

Individual Member, EBN: European Biotechnology Network, Bruxelles - Belgium

IEEE Information Theory Society member #9590 https://www.itsoc.org/profile/9590

Volunteer, ECB: European Congress on Bio-Technology 2016 (Krakow, Poland).

Annual Member, ACS: American Chemical Society, USA

Project Admin- NSF USA (National Science Foundation) Thromboembolism Arterial Haemodynamics

https://simtk.org/projects/tricfd

Reader - NKS: a New Kind of Science
https://www.wolframscience.com/nks

Associate Researcher - Quantum Bioinformatics
https://qcict.org/index.php?p=about
Quantum Computing Institute, South Africa
https://biscuichocolate-1is8qfd.gamma.site/

Shanmuga Praharshit Sharma Kanchinadham

Date of birth: 05/03/1988 | **Nationality:** Indian | **Phone number:** (+91) 7 416 03 2787 (Work) | **Phone number:** (+91) 9625148079 (Mobile) | **Email address:** sharmaji@iscb.org | **Email address:** compbio.iiitd@gmail.com | **Email address:** praharshit1@mail.com | www.github.com/bioinformer | spraharshit@gmail.com | **Skype:** praharshit.sharma |

PERMANENT: KSP SHARMA, s/o DR. K HARIPRASAD, 6/ 188-2,
FLAT-104, RS RESIDENCY, PAPPULA STREET, OPP WATER-TANK,
NEAR SC BOSE PARK, STONEHOUSEPET, SPSR NELLORE DISTRICT,
SRI POTTI SRIRAMULU NELLORE, ANDHRA PRADESH- 524002 (INDIA)

ABOUT ME

I am an Ambitious Computational Biology Researcher, popular in the International Bioinformatics Circuit for my Path-breaking Paradigm Shift the way we decipher Universal Genetic Coding, for having had Resurrected a 1981 Polish Military Intelligence parchment that established NEPIT (Napier constant= 2.71828... encoded) machinery of Ribosomal Translation employing Differential Calculus, whose Validation I reinforced using Information Theory, Coding and Number-theoretical Cryptography approach beginning from the Principle of Computational Equivalence between ECA-QCA (Elementary Cellular Automata and Quaternary Cellular Automata). This result was recently Observed by Me as a Genomic Signature employing Real Datasets in form of TCBShE, Triplet Codon Block Shannon Entropy function. Remarkably, my Seminal work connects 'Codome' to Immunome. For more details, see **www.itsoc.org/profile/9590**

WORK EXPERIENCE

01/07/2022 – CURRENT Western Cape, South Africa

ASSOCIATE RESEARCHER - QUANTUM BIOINFORMATICS QCI-CT: QUANTUM COMPUTING INSTITUTE, CAPE TOWN, WESTERN CAPE, SOUTH AFRICA

https://qcict.org/index.php?p=about

The Quantum Computing Institute in Cape Town (QCI-CT), is in its start-up phase. The QCI-CT aims to advance the field of quantum information, develop new quantum technologies and develop innovative applications.

Business or Sector Information and communication | **Department** Quantum Bioinformatics |

Address Quantum Computing Institute PO Box 50990, Cape Town Western Cape South Africa, 8002, Western Cape, South Africa |

Email spraharshit@gmail.com | **Website** www.dotme.bio/bioinformatics

Link https://www.icgeb.org/alexsandar-radovanovic/

07/02/2022 – 22/02/2022 Jagatpura Jaipur Rajasthan, India

ASSISTANT PROFESSOR JNU JAIPUR NATIONAL UNIVERSITY

DOCENT for UnderGraduate (Honors) BIOINFORMATICS sophomores

25/10/2021 – 23/01/2022 Civil Lines New Delhi, India

BIOINFORMATICS SPECIALIST NATIONAL CENTRE FOR DISEASE CONTROL

Contributed to, as an Integral part of DBT-INSACOG consortium, Data Analytics on IHIP: Integrated Health Information Platform

https://dbtindia.gov.in/insacog

22/03/2021 – 30/09/2021 PObox 6450 Yelahanka Karnataka, India

SENIOR RESEARCH FELLOW ICAR NIVEDI INDIAN COUNCIL OF AGRICULTURAL RESEARCH

National Animal Disease Control Program on Foot and Mouth Disease and Brucellosis of Indian Livestock

01/08/2020 – 12/03/2021 Prayagraj, India

DATA ANALYST INDIAN INSTITUTE OF INFORMATION TECHNOLOGY ALLAHABAD

DBT GenomeIndia mandate project on Genome Compression techniques nodally

Coordinated by CBR Centre for Brain Research IISc Indian Institute of Science Bengaluru

24/04/2019 – 23/04/2020 Near RGIA Airport Hyderabad Rajendranagar, India
DBT BIF TRAINEESHIP NAARM NATIONAL ACADEMY OF AGRICULTURAL RESEARCH MANAGEMENT

SDP Skill Development Program on Agricultural Bioinformatics
ONLY Mains Candidate ARS Agricultural Research Service 2017
Bioinformatics paper for Telangana and Andhra states

02/04/2018 – 31/03/2019 Near CBI Colony Off Madhapur metro station Hyderabad Telangana, India
SCIPRENEUR MANAGING DIRECTOR BGDSIC BIOINFORMATICSHARMA

Officially Registered MSME-D Services Category with NIC Portfolios inclusive of
Bioinformatics Scientific Research and Development and Bioinformatics Education

01/06/2017 – 31/03/2018 Pune Maharashtra, India
GLOBAL BUSINESS DEVELOPMENT MANAGER ARRAYGEN TECHNOLOGIES

Sourced International Computational Genomics Clientele for ArrayGen
from Nigeria and Kuwait ArrayGen being First of its kind to Train Bioinformaticians in NEPAL

02/11/2016 – 31/05/2017 Narayana Health City South Bengaluru Karnataka, India
SENIOR RESEARCH FELLOW ELIZABETH AND EMMANUEL KAYE BIOINFORMATICS BIOSTATISTICS UNIT THROMBOSIS RESEARCH INSTITUTE UK OUTSTATION LAB INDIA

Worked on "nComputing" nodes where "7 Major International Bioinformatics Servers" converge,
my Arterial Haemodynamics Project Work hosted in National Science Foundation USA portal

https://simtk.org/projects/tricfd

25/09/2015 – 18/09/2016 Warsaw, Poland
ERASMUS MUNDUS DOCTORATE RESEARCHER SZKOLA GLOWNA GOSPODARSTWA WIEJSKIEGO W WARSZAWIE

Developed an Original "B2TMxCT" algorithm, Binary to Ternary Multiplicative Coordinate Transformation Algorithm, toward -
Kanchinadham SPS. LCR - classification of Creixell alignment of human kinome [version 1; not peer reviewed]. *F1000Research* 2016, **5**:2665 (poster) **https://doi.org/10.7490/f1000research.1111224.1**

Business or Sector Professional, scientific and technical activities | **Department** Faculty of Agriculture and Biology |

Address 166 Nowoursynowska, Masovian Voivodeship, 02-787, Warsaw, Poland | **Email** erasmusplus@sggw.edu.pl |

Website https://zenodo.org/records/5520527

Link https://pawlowskilab.wordpress.com

01/04/2014 – 19/02/2015 Habsiguda Hyderabad Swarnandhra Pradesham, India
BIOINFORMATICS PROJECT FELLOW STAFF NR 8676 CSIR CCMB CENTRE FOR CELLULAR AND MOLECULAR BIOLOGY

Developed and Constructed MULTIPLICITY Mx and COOPERATIVITY Cx matrices toward constructing
Sharma P. MiRNA-gene interactome of schizophrenia [version 1; not peer reviewed]. *F1000Research* 2016, 5:27 (slides)

https://doi.org/10.7490/f1000research.1111224.1

18/10/2013 – 31/12/2014 DBT BCIL Biotech Consortium India Limited New Delhi, India
BIOINFORMATICS INDUSTRIAL TRAINEE BIOSERVE BIOTECHNOLOGIES PRIVATE LIMITED

Differential Gene Expression in Rice Transcriptome and Quality Control
Var-Seq SNP calling of Ecoli DH10B Strain on iON Torrent PGM platform

04/07/2010 – 13/12/2010 Tarnaka Hyderabad Andhra Pradesh, India
MASTERS DISSERTATION PRACTICE SCHOOL 2 CSIR IICT INDIAN INSTITUTE OF CHEMICAL TECHNOLOGY

Heterogeneous Catalysis employing HPAs HeteroPolyAcids
accomplished within IPC Division Inorganic and Physical Chemistry
under First Lady CSIR Director Organometallochemist Dr Laxmi Kantham

22/05/2008 – 15/07/2008 Steel Town Bhadravati Shimoga District, India
SUMMER INTERNSHIP PRACTICE SCHOOL 1 STEEL AUTHORITY OF INDIA LIMITED VISWESWARAYA IRON AND STEEL PLANT

Spectrochemical Analysis of Alloying Elements Gases in Steel and Time Management in Metallurgical QC Laboratory

DIGITAL SKILLS

C, C++c C# | MySQL, SQL, SQLite, PostgreSQL | Python (PyROOT, RDataFrame; ML: Keras, TensorFlow) | R / Bioconductor | Fish (shell) | Linux (Terminal Commands, Bash/Shell) | matlab, scilab, mathematica | Bioinformatics tools & databases | Computational Biology | NGS data analysis | Pipelining and version control: Snakemake, Nextflow, Conda and git | Data Science: AI,ML, NLP, DL, Statistics, DM, Regression, NN,Segmentation, Classification,

EDUCATION AND TRAINING

25/09/2015 – 18/09/2016 Warszawa, Poland

DOCTORATE MOBILITY PROGRAM BIOTECHNOLOGY FUNDED BY ERASMUS MUNDUS EUROPEAN UNION SggW - Warsaw University of Life Sciences Poland EUROPE

Bioinformatics Genomics Mathematica Mathematical Modeling Molecular Biology IPR in Biotechnology and Mandatory Polish Language Pedagogy

Address Budynek 37, 166 Nowoursynowska street, 02-787, Warszawa, Poland |

Website https://cuo.ac.in/Erasmus-Mundus/EUPHRATES-for-CUO.pdf | **Field of study** BIOTECHNOLOGY | **Final grade** 8.904 ECTS |

Level in EQF EQF level 8 | **National classification** PQF 8 - https://prk.men.gov.pl/en/1en |

Type of credits ECTS : European Credit Transfer System | **Number of credits** 29.5 | **Valid until** 31/12/2033 |

Thesis B2TMxCT algorithm Development a Binary to Ternary Multiplicative Coordinate Transformation paradigm to Map Low Complexity Regions in Protein Multiple Sequence Alignments

Link https://www.itsoc.org/profile/9590

16/08/2011 – 17/08/2013 Gangtok Sikkim, India

MASTER OF SCIENCE MS IN BIOINFORMATICS Sikkim Manipal University

Website https://www.ibab.ac.in/wp-content/uploads/2020/09/PGDB_11.pdf | **Field of study** BIOINFORMATICS |

Final grade B 66.69 %

01/08/2005 – 28/07/2011 Birla Institute of Technology and Science Pilani 333031 Rajasthan, India

INTEGRATED MSC HONORS CHEMISTRY BITS Pilani

Website https://www.bits-pilani.ac.in/pilani/chemistry/ | **Field of study** CHEMISTRY | **Final grade** 6.91

07/07/2003 – 23/05/2005 New Delhi, India

HSC CLASS 10+2 CBSE NEW DELHI CBSE Central Board of Secondary Education

Website https://cbseacademic.nic.in//index.html | **Field of study** Computer Science and Physics Chemistry Mathematics |

Final grade 87.8 %

05/07/1993 – 24/05/2003 Ranipet 632406 Tamil Nadu, India

SSC CLASS X CBSE NEW DELHI DAV BHEL School

Website https://bhelranipet.davchennai.org/ | **Field of study** HINDI with Science and Mathematics | **Final grade** 81.2 %

ADDITIONAL INFORMATION

PUBLICATIONS

7+ Original Solo Authored BIOINFORMATICS and COMPUTATIONAL BIOLOGY preprints hosted in CERN **Switzerland Server**

– 2023

https://zenodo.org/search?q=Praharshit&l=list&p=1&s=10&sort=bestmatch

Praharshit Sharma et. al.

Link https://zenodo.org/search?q=Praharshit&l=list&p=1&s=10&sort=bestmatch

A MATHEMATICAL MODEL OF CENTRAL DOGMA OF MOLECULAR BIOLOGY EMPLOYING A NOVEL IRRATIONAL-INTEGRAL-IMAGINARY (I3) ENCODING AND NUMERICAL APPROXIMATION BASED ON CELLULAR AUTOMATON

– 2014

Praharshit Sharma et al

CONFERENCES AND SEMINARS

2011 – 2023 – International Worldwide and Global

18 Conference Proceedings in Faculty of 1000 UK platform https://f1000research.com/search?q=Praharshit

12 Oral Presentations PPT slides, and
6 PDF A0 format Poster Presentations

Links https://f1000research.com/search?q=Praharshit&selectedDomain=slides | https://f1000research.com/search?q=Praharshit&selectedDomain=posters

PROJECTS

02/11/2016 – 31/05/2017

CFD Computational Fluid Dynamics analysis of Arterial flow in Thromboembolism Hosted in NSF National Science Foundation USA https://simtk.org/projects/tricfd

https://simtk.org/users/pstri

https://simtk.org/project/memberlist.php?group_id=1233

Link https://cfd.life/en/

VOLUNTEERING

2007 – 2008 Pilani 333031 Rajasthan India

NSS National Service Scheme BITS Pilani Rajasthan Chapter Documentation Coordinator We at our NSS BITS chapter are All-time record Holders, for being amongst the
Largest Blood Donors (by number of Units) for **IRCS** (Indian Red Cross Society)

Link https://www.bits-pilani.ac.in/hyderbad/national-service-scheme-nss/

MANAGEMENT AND LEADERSHIP SKILLS

Coordinator for BITS Embryo Project during Undergrad Was instrumental in organizing the FIRST ever TRI-campus BITS Embryo Video-Conferenced Lecture (On AT&T Bell Connect) platform, across 3 Time Zones and 4 International Cities: delivered by London Business School Grad and BITS Alumnus Abhinav Khushraj across BITS Dubai Campus, and Goa, Pilani campuses.

Link http://embryo.bits-pilani.ac.in/

HONOURS AND AWARDS

English Core MERIT Certificate issued by CBSE New Delhi For being amongst Top **0.1% (1 in 1000) at All India Level,** in Nation-wide HSC Examination conducted by the Central Board of Secondary Education, New Delhi, India.

HOBBIES AND INTERESTS

Cartooning Whistling and Poetry.

https://bitsianpoems.wordpress.com/

Link https://bitsianpoems.wordpress.com/

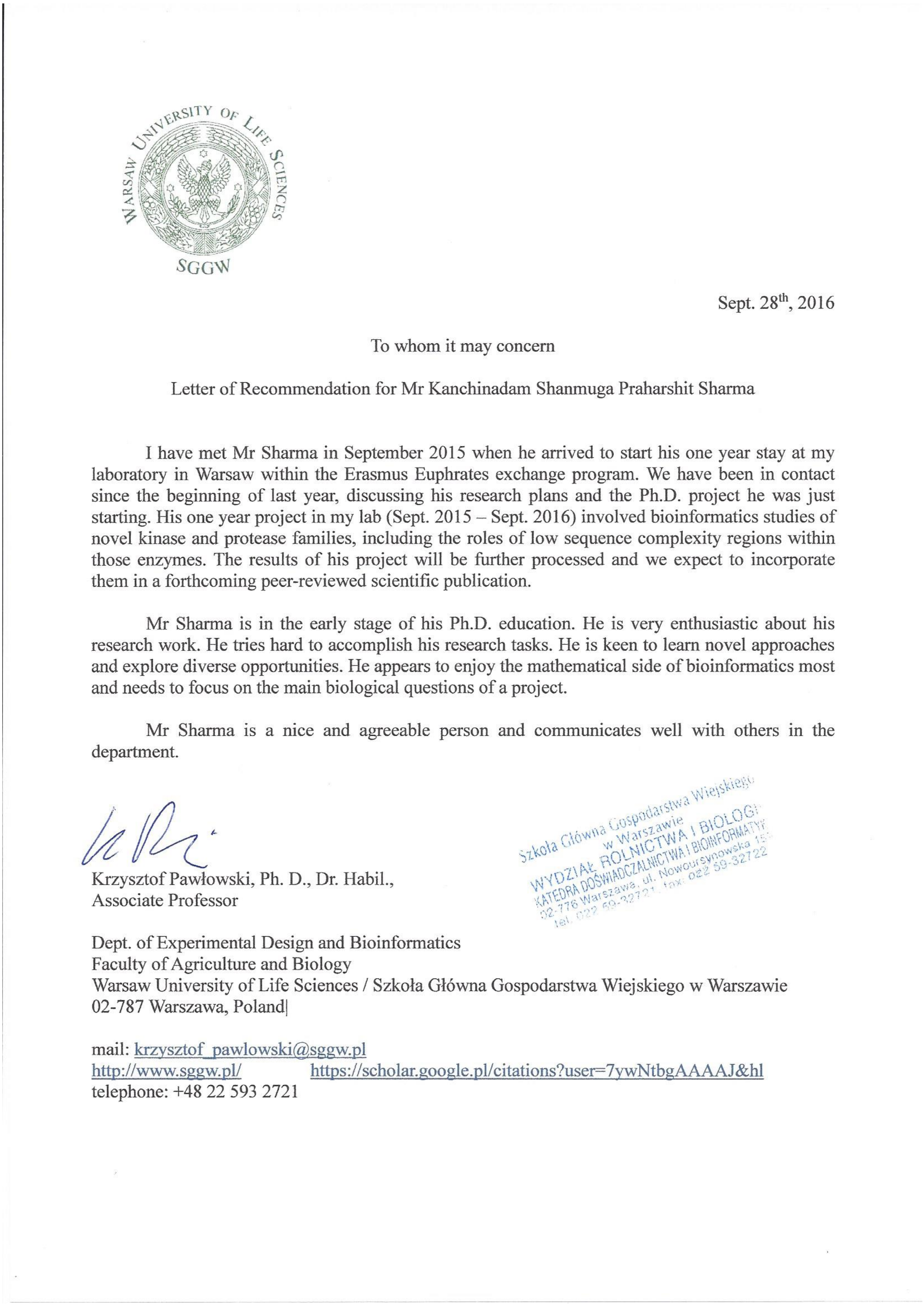
The Under-signed hereby declares and certifies that all the preceding information as well as details afore-mentioned are true and authentic to the best of his knowledge and belief, moresoever that Processing of my Personal data complies with GDPR (General Data Protection Regulation) Regime in force, my Self-Vested Intellectual Property Rights having NO Conflict of Interest whatsoever.

LATEST__UPDATED_Curriculum-Vitae (CV)=

HYDERABAD , 11-MARCH-2026 , ***WEDNESDAY***

Shanmuga Praharshit
Sharma Kanchinadham

RecoLetters.pdf



Sept. 28th, 2016

To whom it may concern

Letter of Recommendation for Mr Kanchinadam Shanmuga Praharshit Sharma

I have met Mr Sharma in September 2015 when he arrived to start his one year stay at my laboratory in Warsaw within the Erasmus Euphrates exchange program. We have been in contact since the beginning of last year, discussing his research plans and the Ph.D. project he was just starting. His one year project in my lab (Sept. 2015 – Sept. 2016) involved bioinformatics studies of novel kinase and protease families, including the roles of low sequence complexity regions within those enzymes. The results of his project will be further processed and we expect to incorporate them in a forthcoming peer-reviewed scientific publication.

Mr Sharma is in the early stage of his Ph.D. education. He is very enthusiastic about his research work. He tries hard to accomplish his research tasks. He is keen to learn novel approaches and explore diverse opportunities. He appears to enjoy the mathematical side of bioinformatics most and needs to focus on the main biological questions of a project.

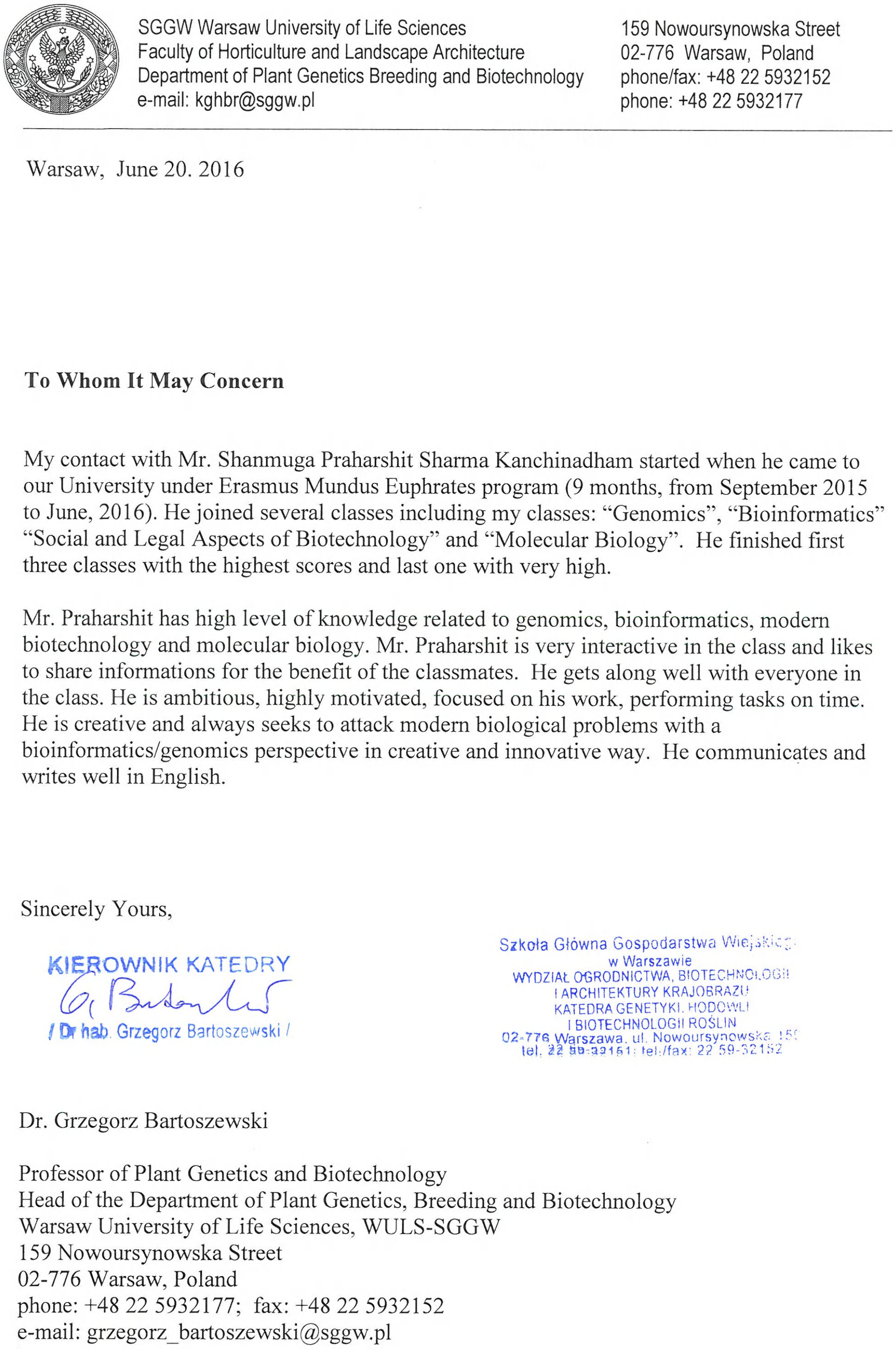
Mr Sharma is a nice and agreeable person and communicates well with others in the department.

Szkoła Główna Gospodarstwa Wiejskiego
w Warszawie
WYDZIAŁ ROLNICTWA I BIOLOGII
KATEDRA DOŚWIADCZALNICTWA I BIOINFORMATYKI
02-776 Warszawa, ul. Nowoursynowska 159
tel. 022 59-32721, fax: 022 59-32722

Krzysztof Pawłowski, Ph. D., Dr. Habil.,
Associate Professor

Dept. of Experimental Design and Bioinformatics
Faculty of Agriculture and Biology
Warsaw University of Life Sciences / Szkoła Główna Gospodarstwa Wiejskiego w Warszawie
02-787 Warszawa, Poland

mail: krzysztof_pawlowski@sggw.pl
http://www.sggw.pl/ https://scholar.google.pl/citations?user=7ywNtbgAAAAJ&hl
telephone: +48 22 593 2721



SGGW Warsaw University of Life Sciences
Faculty of Horticulture and Landscape Architecture
Department of Plant Genetics Breeding and Biotechnology
e-mail: kghbr@sggw.pl

159 Nowoursynowska Street
02-776 Warsaw, Poland
phone/fax: +48 22 5932152
phone: +48 22 5932177

Warsaw, June 20. 2016

To Whom It May Concern

My contact with Mr. Shanmuga Praharshit Sharma Kanchinadham started when he came to our University under Erasmus Mundus Euphrates program (9 months, from September 2015 to June, 2016). He joined several classes including my classes: “Genomics”, “Bioinformatics” “Social and Legal Aspects of Biotechnology” and “Molecular Biology”. He finished first three classes with the highest scores and last one with very high.

Mr. Praharshit has high level of knowledge related to genomics, bioinformatics, modern biotechnology and molecular biology. Mr. Praharshit is very interactive in the class and likes to share informations for the benefit of the classmates. He gets along well with everyone in the class. He is ambitious, highly motivated, focused on his work, performing tasks on time. He is creative and always seeks to attack modern biological problems with a bioinformatics/genomics perspective in creative and innovative way. He communicates and writes well in English.

Sincerely Yours,

KIEROWNIK KATEDRY
/ Dr hab. Grzegorz Bartoszewski /

Szkoła Główna Gospodarstwa Wiejskiego
w Warszawie
WYDZIAŁ OGRODNICTWA, BIOTECHNOLOGII
I ARCHITEKTURY KRAJOBRAZU
KATEDRA GENETYKI, HODOWLI
I BIOTECHNOLOGII ROŚLIN
02-776 Warszawa, ul. Nowoursynowska 159
tel. 22 59-32151; tel./fax: 22 59-32152

Dr. Grzegorz Bartoszewski

Professor of Plant Genetics and Biotechnology
Head of the Department of Plant Genetics, Breeding and Biotechnology
Warsaw University of Life Sciences, WULS-SGGW
159 Nowoursynowska Street
02-776 Warsaw, Poland
phone: +48 22 5932177; fax: +48 22 5932152
e-mail: grzegorz_bartoszewski@sggw.pl

nencki institute
of experimental biology

Michal Dabrowski, PhD (medicine), DSc (biology)
Head of the Laboratory of Bioinformatics
Nencki Institute of Experimental Biology
Warsaw, Poland

22.02.2016

Assesment of performance of Praharshit Sharma

Praharshit Sharma participated in a two-weeks mini-internship at the Laboratory of Bioinformatics, Nencki Institute, Warsaw, 15-26.02.2016. Notably, the internship was on his initiative, undertaken in his free time (inter-semester break) and he has done all the work on a voluntary basis.

For the internship Praharshit was given a specific well-defined task, which was to explore the content of our Nencki Genomics Database (http://www.nencki-genomics.org/) to compare the regulatory regions of the micro-RNA genes and of the mRNA-encoding genes.

To fulfill this task he used and extended his knowledge of the SQL language on the MySQL server platform. Then, in the R computing language environment, he prepared elegant visualizations of the database reports.

His work led to a useful conclusion that the content of the promoter regions of both classes of genes is similar, with the exception of a particular histone modification, confirming and extending previous results by other groups. Overall, he did very well on this assignment.

During his internship Praharshit has also given a seminar to our group of the Laboratory of Bioinformatics, entitled: “BIG-DATA Genetic Code (BDGC)”, about his own previous scientific work. He focused on two topics, of which the first was the (near-) optimality of the genetic code, i.e. how encoding of 20 amino acids, and of the frequencies of their substitutions, can optimally be performed using four bases.

The second topic was “the super-reference Genome”, in this part Praharshit proposed that the sequences of *all* the genomes can be represented as a single *Entropy Based Decision Tree*. This concept has not yet been fully developed by Praharshit, but several members of our group (composed of biologists and a mathematician), including the undersigned, have found it interesting and worth of further work.

The thoughts of Praharshit are highly stimulating but at the same time difficult to follow. He is sometimes too eager to interpret some numerical identities as arguments for correctness of a particular model. In my opinion, working on general, largely computational problems and with strong tutoring Praharshit Sharma may achieve interesting and original results.

Michal Dabrowski

ul. Pasteura 3, 02-093 Warszawa, tel. centrala (48 22) 589 20 00, fax (48 22) 822 53 42
e-mail: dyrekcja@nencki.gov.pl, http://www.nencki.gov.pl

BIRLA INSTITUTE OF TECHNOLOGY & SCIENCE (BITS)
PILANI – 333031 (RAJASTHAN) INDIA

Dr. G.S.Chauhan, ***Assistant Professor***
Languages Group
Faculty Division – I

Email: gsc@bits-pilani.ac.in
Phone No: +91-9413150096
Fax: +91-1596-244183

Dated: 29-August-2011

TO WHOMSOEVER IT MAY CONCERN

Dear Sir/ Madam,

I am writing to you recommending **K.S. PRAHARSHIT SHARMA,** whom I have known personally and professionally for around four years, from 2007 to 2011 at BITS. I wish to inform you that Mr. Praharshit is keenly desirous of pursuing a **Masters/ PhD in Bioinformatics** under your guidance at your respective institution of affiliation.

Mr. Praharshit has maintained consistency across the **courses which interest him the most,** which he opted for under the elective scheme at BITS, as reflected by his performance in the same as enlisted below:

- **'A'** grade in **Effective Public Speaking** course;
- **'A'** grade in **International Relations** course;
- **'A'** grade in **Professional Ethics** course;
- **'A'** grade in **Srimad Bhagvad Gita** course;
- **'B'** grade in **Contemporary India** course;
- **'B'** grade in **Report and Write for Media** course;
- **'B'** grade in **Introductory Psychology** course;
- **'B'** grade in **Dynamics of Social Change** course.

Keeping the above aspects in view, and that Mr. Praharshit is a well-read person (especially important in research aspects like literature survey, citation analysis etc.), I strongly recommend him for enrolment in the above-mentioned program in your institution.

Thanking you,
Truly yours,

-Signed-
(Dr. G.S.Chauhan)

-Official Seal of Personnel/ Department-

Department of Languages
Birla Institute of Technology & Science
PILANI (Raj.) 333031

BIRLA INSTITUTE OF TECHNOLOGY & SCIENCE (BITS)
PILANI – 333031 (RAJASTHAN) INDIA

Dr. K.N.Sachdev, ***Assistant Professor***
Humanistic Studies Group
Faculty Division – I

Email: kns@bits-pilani.ac.in
Phone No: +91-1596-515390
Fax: +91-1596-244183

Dated: 29-August-2011

TO WHOMSOEVER IT MAY CONCERN

Dear Sir/ Madam,

I am writing to you supporting the candidature of **K.S. PRAHARSHIT SHARMA,** for a **Masters/ PhD in Bioinformatics** under your guidance at your respective institute/ university.

I have known Mr. Praharshit for around a year-and-a-half, between 2009 to 2011 at BITS, both as the warden of Ram Bhawan (a student hostel in BITS), and the instructor-in-charge of two of his elective courses.

Mr. Praharshit is gifted with a well-rounded balance of analysis and synthesis, and has shown signs of a budding research aptitude and asks meaningful doubts beneficial to one and all in the classroom (especially a plus in research settings such as conference-proceedings, symposia, colloquia and the like), as I could gauge from his able performance in the two elective courses he opted for under me, as already referred to above, which is as follows:

- **Professional Ethics** course – **Grade 'A';**
- **Dynamics of Social Change** course – **Grade 'B'.**

Also, Mr. Praharshit has authored a original term paper titled **'Social Groups and their institutions of leadership in BITS'** utilizing a research method called **'Sociological Method.'**

Keeping the above points in mind, I strongly recommend Mr. Praharshit Sharma as a promising candidate to enroll as a Masters/ PhD student in Bioinformatics in your university.

Thanking you,
Truly yours,

-Signed-
(Dr. K.N.Sachdev)

-Official Seal of Personnel/ Department-

Department of Humanistic Studies
Birla Institute of Technology & Science
PILANI (Raj.) 333031

BIRLA INSTITUTE OF TECHNOLOGY & SCIENCE (BITS)
PILANI – 333031 (RAJASTHAN) INDIA

Dr. Subit K.Saha, ***Associate Professor***
Chemistry Group
Faculty Division-III

Email: sksaha@bits-pilani.ac.in
Phone No: +91-1596-515238
Fax: +91-1596-244183

Dated: 29-August-2011

TO WHOMSOEVER IT MAY CONCERN

Dear Sir/ Madam,

I have come to know that my student **Mr. K.S.Praharshit Sharma** has chosen to pursue his **Masters/ PhD in Bioinformatics** in your institute. I have known Mr. Praharshit for the past two years, and could analyze him from close quarters while I taught him Chemical Thermodynamics course and was his warden at Budh Bhawan (a student hostel at BITS).

During my association with him, I found Mr. Praharshit to be a sincere young man, always working hard towards a deeper understanding of the subject. His enduring interest to keep track of the latest research developments in his field by going through journals such as **Nature** and **Science** regularly in the BITS library shows his inquisitive nature.

Mr. Praharshit has very good leadership qualities and team-skills as a **Core Member** of **Chemistry Association** and **Organizing Member** of **Forensic Sciences Workshop** at BITS during the annual technical festival of BITS – APOGEE 2008. With regard to his consistent overall academic record and above said traits, I would rate him among the **top 10%** of the students of Master of Science (~~of~~ Honors) in Chemistry program in his class. I would like to add, though, that his overall grades do not give a true picture of his potential scholastic aptitude and he is capable of much more.

Having known Mr. Praharshit as a student of whom his mentors feel proud, I state confidently that he can accomplish any task assigned to him with devotion and bring laurels to the institute in which he is enrolled. So, I strongly recommend him for admission into **Masters/ PhD program in Bioinformatics** at your institute with adequate financial aid.

Thanking you,
Truly yours,

-Signed-
(Dr. Subit K.Saha)

-Official Seal of Personnel/ Department-

Dr. Subit Kumar Saha
Chemistry Group
Birla Institute of Technology & Science
Pilani - 333 031 (Rajasthan)

BIRLA INSTITUTE OF TECHNOLOGY & SCIENCE
PILANI, RAJASTHAN – 333 031
INDIA

Prof. N. V. MURALIDHAR RAO
DEAN, EDUCATIONAL HARDWARE DIVISION
PROFESSOR, DEPARTMENT OF ECONOMICS & FINANCE

Dated: 29-August-2011

TO WHOMSOEVER IT MAY CONCERN

Dear Sir/ Madam,

I am writing to you on behalf of **K.S. PRAHARSHIT SHARMA,** whom I have known for around five years, from 2006 to 2011 at BITS. Mr. Praharshit is keenly desirous of pursuing a **Masters/ PhD in Bioinformatics** under your guidance at your respective institute of affiliation.

Mr. Praharshit is a strong-willed, silent person and has exhibited tremendous amount of team work and dedication (so much more important in today's research world where global mobility and collaborations form the order of the day), in the following forms respectively:

- As a **coordinator of "Project BITS Embryo",** enhancing on-campus education through online, live, video-conferencing lectures delivered by BITS Alumni spread worldwide;
- As a **coordinator of NSS (National Service Scheme)** Documentation Team, spreading social awareness on-campus by editing and contributing to Newsletter articles;
- As a **Group Leader (Publicity)** of Creative Activities Club, in Cultural events like OASIS;
- As **Organizing Member** of Forensic Sciences Workshop, in Technical fests like APOGEE.

Keeping the above aspects in view, I strongly recommend Mr. Praharshit Sharma as a promising candidate to enroll as a Masters/ PhD student in Bioinformatics in your institution.

Thanking you,

Truly yours,

N. V. Muralidhar Rao

(N V MURALIDHAR RAO)

DEAN
UCATIONAL HARDWARE DIVISION
I.T.S., PILANI (RAJASTHAN [illegible]

Phone : +91-1596-245073 Ext. 259 (O); +911596515259 (O) **e-mail: nvmrao@bits-pilani.ac.in**
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SGGW/ Warsaw University of Life Sciences
Department of Plant Genetics Breeding and Biotechnology,
Nowoursynowska st. 159, Bld. 37
02-776 Warsaw, Poland
Phone: (+ 48) 22 5932178
Email: <marek_koter@sggw.pl>

Dated: Wednesday, 18 January 2017.

TO WHOM IT MAY CONCERN

Mr. Praharshit Sharma arrived at our SGGW/ Warsaw University of Life Sciences (Poland) in late September, 2015 and had a One-year stay here, as part of his Erasmus Mundus EUPHRATES program, in “Biotechnology”. http://www.usc.es/euphrates/

Recognizing his prior advanced training and exposure, our Department, under whose faculty he had underatken the “Bioinformatics” course in Winter 2015 Semester – allowed him to present his already done work on **Micro-RNA gene interactome of Schizophrenia,** which Mr. Praharshit had previously carried out at CSIR – Center for Cellular & Molecular Biology, India ; based upon such an End-semester Seminar whereupon he was awarded an **A-grade** in the “Bioinformatics” course.

http://dx.doi.org/10.7490/f1000research.1111224.1

Overall, Mr. Praharshit has expressed the spirit of “Creative Entreprise” in the field of Bioinformatics, and has openly delivered an informal talk on his innovative product called **NGS-pendrive,** a platform-independent NGS data analysis self-sufficient device, which has received quite a positive appreciation from Me and one of our PhD students at the Department.

www.tinyurl.com/ngspendrive

I would like to strongly recommend Mr. Praharshit for the TIGP-IIP Summer 2017 specifically, and in general for any Higher-Studies like PhD/ Post-Doc in Bioinformatics he may wish to pursue.

Sincere regards

(Dr. Marek Koter, PhD)
SGGW/ Warsaw University of Life Sciences, Poland.

B. M. BIRLA
Science & Technology Centre

Birla Institute of Scientific Research
Statue Circle, Jaipur - 302 001, Rajasthan, India
Tel. : (0141) 2385283, 2385094, Fax : (0141) 2385121
Website : www.bisr.res.in

Jaipur, India
May 1, 2018. 1130 hrs.

To Whom It May Concern:

It gives me an immense pleasure to recommend Praharshit Sharma as a candidate with you at Weizmann institute, Israel. I have known him through Bioclues forum since January 2013. Nonetheless, ever since he started his project on the analyses of a 2-dimensional non-Heteroatom ANISOU data where he was extrapolating considered residue-wise values into 1-dimensional array of F-values using bioinformatics algorithms. He was then working on the SSD and PSD - sample and population standard deviation studies. I was a mentor on bioinformatics application part of his analyses.

Harsh has a good temperament, composure to understand the how of a problem formulation and zeal to move forward in the field of Bioinformatics. I think he has a caliber in the stream of Bioinformatics enabled biotechnologies which allows him to drive research goals and as well have a flair for working towards accomplishing the projects easily. I also envisage that as a Mathematician and Bioinformaticist, he has good knowledge in Biology as equally as in IT concepts. And I think that is the need of the hour these days. He brought into deep insight on this while working on the project with us on ‘Conserved Entities in Plants and Humans Immune System.’ He is more than a plus at work, sincere, and workaholic in nature both in thoughts and debate. On a slightly negative side, he flips his emotions and is flabbergasting at times, but I don’t see it as a problem anyways to master his project.

I would highly recommend him for this graduate school towards his candidacy.

Yours Sincerely

Prashanth N Suravajhala, PhD
Research Scientist , Systems Biology
Department of Biotechnology and Bioinformatics
Birla Institute of Scientific Research
Statue Circle, Jaipur 302001 RJ, India
Telephone: (work) +91-141-2385094. Extension 308
E mail: prash[AT]bisr[DOT]res[DOT]in

To
Milana Morgensenstern, PhD
milana.morgenstern@biu.ac.il

Praharshit Sharma <kspsharma@gmail.com>

I would like to go with You to stockholm to receive Nobel Prize for Improving Cric & Watson model of DNA-RNA CODE

Jerzy Achimowicz <jachimow@wiml.waw.pl> Thu, Jan 2, 2014 at 7:54 AM
Reply-To: jerzy.achimowicz@wiml.waw.pl
To: kspsharma@gmail.com
Cc: jachimow@hotmail.com

Dear Sir,

I am impressed with your work on genetic code

with finite automaton approach,

Have tried to call you but

at this number nobody speaks english

Please get in touch witm me ASAP

Jerzy Achimowicz

PS. Are You registered at Researchgate portal (facebook for scientist)

then you can read what I have wrote about You at:

https://www.researchgate.net/post/What_does_the_concept_of_information_mean_in_biology

--

Jerzy Achimowicz Ph.D. Dr.Sci. Ltn Col Res.

Head of Psychophysiological Laboratory
Flight Safety Division

Polish Airforce Institute of Aviation Medicine
krasinskiego 54 Street,

01-755 Warsaw, Poland
tel/fax +48 (22) 685-2961

mobile:+48 793 153 371

EMBL

Certificate

Praharshit Sharma

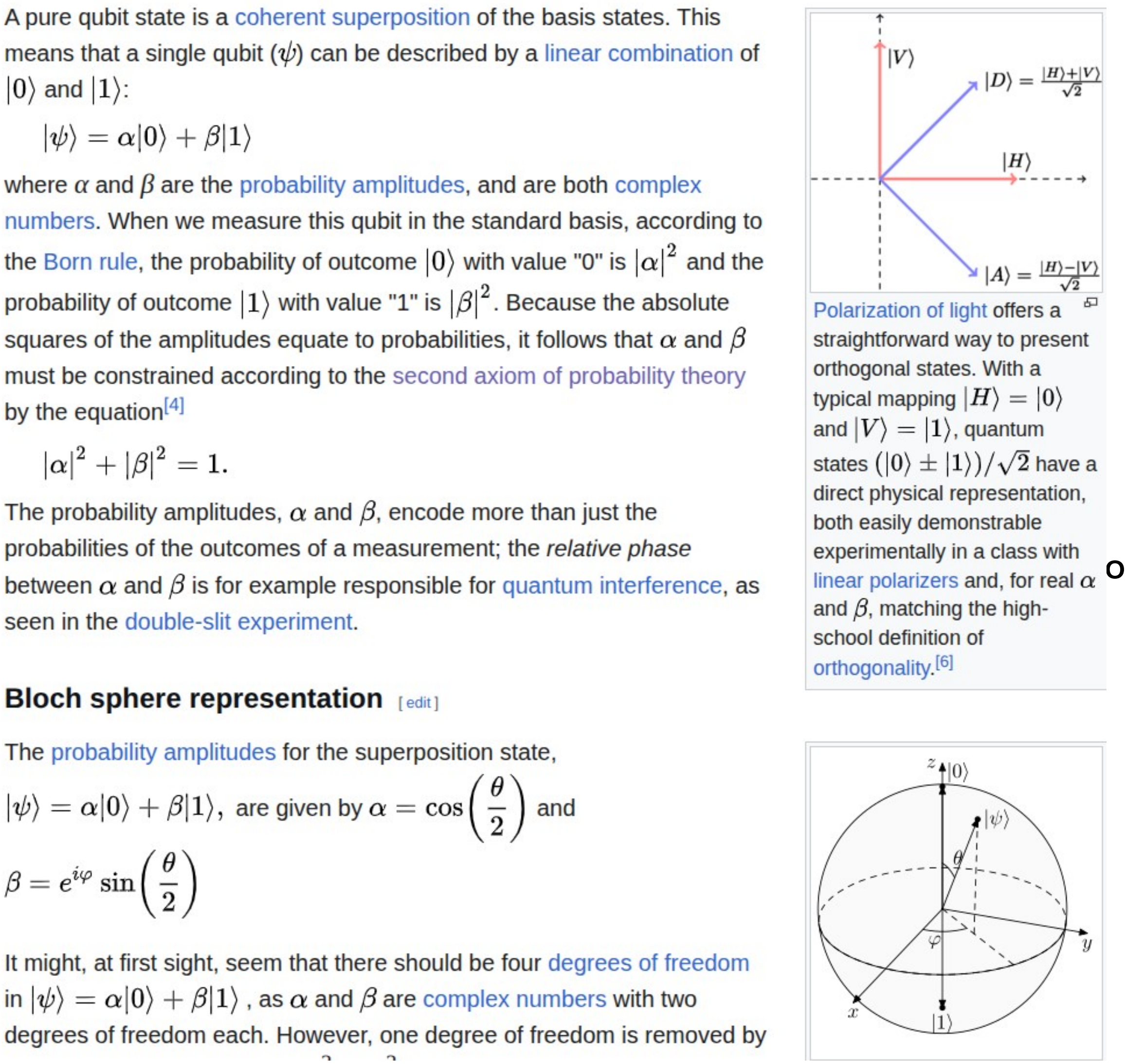
attended the

25th EMBL PhD Symposium (VP)

20 - 22 November, 2023, Virtual

EMBL
European Molecular Biology Laboratory
Course and Conference Office
Meyerhofstr. 1
D-69117 Heidelberg, Germany

Heidelberg, 1 December, 2023



A pure qubit state is a coherent superposition of the basis states. This means that a single qubit (ψ) can be described by a linear combination of $|0\rangle$ and $|1\rangle$:

$$|\psi\rangle = \alpha|0\rangle + \beta|1\rangle$$

where α and β are the probability amplitudes, and are both complex numbers. When we measure this qubit in the standard basis, according to the Born rule, the probability of outcome $|0\rangle$ with value "0" is $|\alpha|^2$ and the probability of outcome $|1\rangle$ with value "1" is $|\beta|^2$. Because the absolute squares of the amplitudes equate to probabilities, it follows that α and β must be constrained according to the second axiom of probability theory by the equation[4]

$$|\alpha|^2 + |\beta|^2 = 1.$$

The probability amplitudes, α and β, encode more than just the probabilities of the outcomes of a measurement; the *relative phase* between α and β is for example responsible for quantum interference, as seen in the double-slit experiment.

Polarization of light offers a straightforward way to present orthogonal states. With a typical mapping $|H\rangle = |0\rangle$ and $|V\rangle = |1\rangle$, quantum states $(|0\rangle \pm |1\rangle)/\sqrt{2}$ have a direct physical representation, both easily demonstrable experimentally in a class with linear polarizers and, for real α and β, matching the high-school definition of orthogonality.[6]

Bloch sphere representation [edit]

The probability amplitudes for the superposition state, $|\psi\rangle = \alpha|0\rangle + \beta|1\rangle$, are given by $\alpha = \cos\left(\frac{\theta}{2}\right)$ and

$$\beta = e^{i\varphi}\sin\left(\frac{\theta}{2}\right)$$

It might, at first sight, seem that there should be four degrees of freedom in $|\psi\rangle = \alpha|0\rangle + \beta|1\rangle$, as α and β are complex numbers with two degrees of freedom each. However, one degree of freedom is removed by

P. Sharma,
S. Thakur
R.S. Chauhan

“Base-Paper-Citation”

Chauhan, R. S., Thakur, S., &

Kanchinadham, S. P. S. (2026).

Overall Synonymous Codon Usage Bias strongly Correlates with Codome Core Length anent Harmonic Mean based Computation of Kullback-Leibler Divergence in an ECA-QCA System.

https://doi.org/10.5281/zenodo.19200298

https://zenodo.org/records/19200298

Amplitude Encoding and Circle Notation

As we start thinking more concretely about the numerical values of register amplitudes it becomes useful to remind ourselves how amplitudes are represented in circle notation, and highlight a potential pitfall. The filled-in areas in circle notation represent the squared *magnitudes* of the (potentially complex) amplitudes of a quantum state. In cases like amplitude encoding, where we want these amplitudes to assume real-valued vector components, this means that the filled-in areas are given by the *square* of the associated vector component, rather than simply the vector component itself. Figure 9-8 shows how we should properly interpret the circle notation representation of the vector `[0,1,2,3]` after normalization.

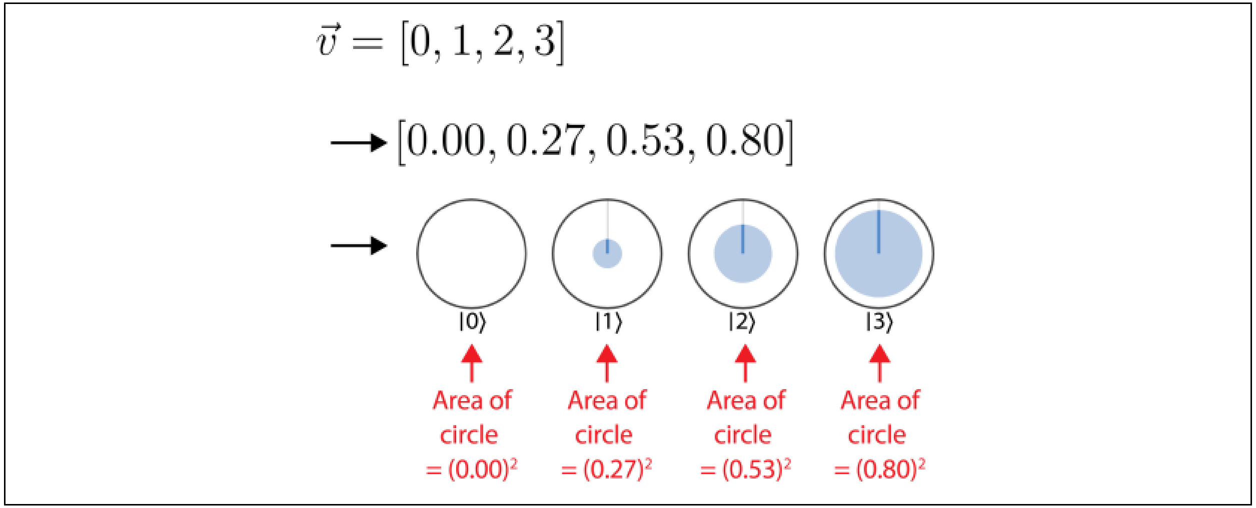


Figure 9-8. Correct amplitude encoding with a properly normalized vector

Plasmodium falciparum, the primary cause of severe malaria in humans, **possesses one of the most extreme genomic compositions of any eukaryote, characterized by an exceptionally low GC content (guanine-cytosine).** Genomic GC Composition. **The P. falciparum genome is approximately 80% AT-rich, with an overall GC content of under 20%.** This bias is not uniform across all genomic regions:

- Coding Regions: These are relatively more "GC-rich" but still highly biased, typically containing about 30–31% GC (69% AT).
- **Non-coding Regions: These exhibit even more extreme bias, often reaching 86–90% AT content.**

“Inspired by 2 Articles of my Guide”

Santosh, T., Ramesh, D., & Reddy, D. (2020). LSTM based prediction of malaria abundances using big data. Computers in Biology and Medicine, 124, 103859.

- **Thakur, S., & Dharavath, R. (2019). Artificial neural network-based prediction of malaria abundances using big data: A knowledge capturing approach. Clinical Epidemiology and Global Health, 7(1), 121-126.**

GC Content QUBIT Capture: **> ket<0| & < ket<1|**

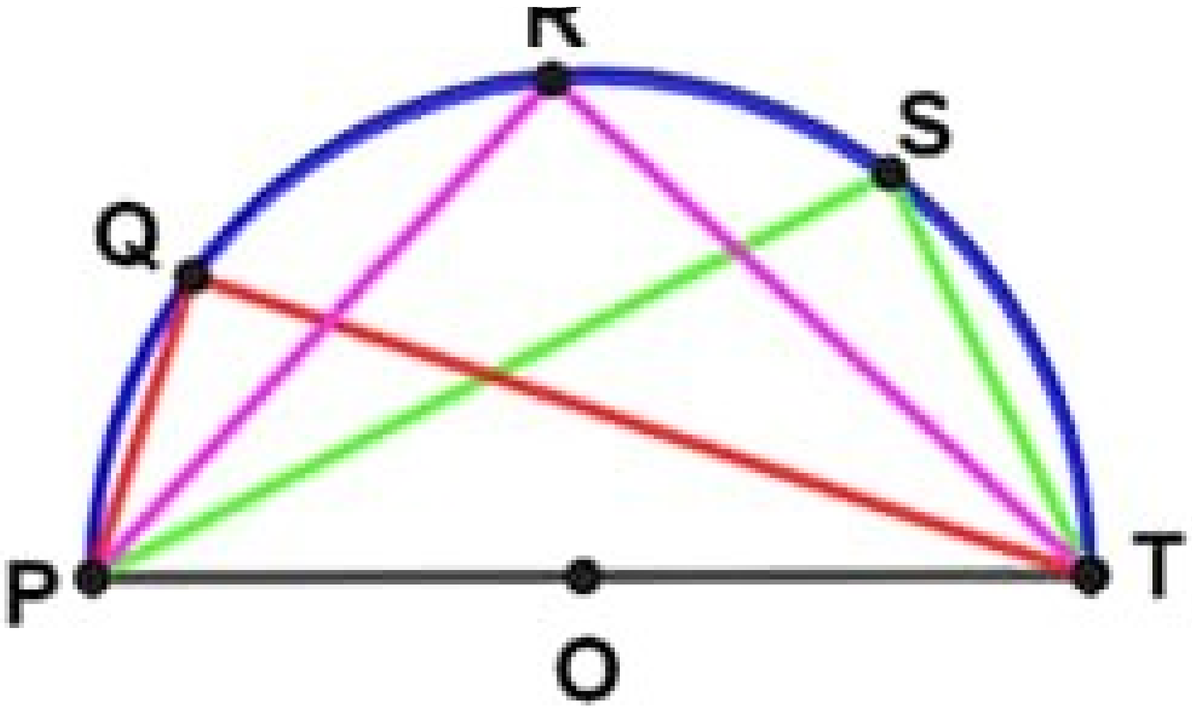
Biological Extremes in NatureGC content varies widely across different life forms due to evolutionary pressures, environmental adaptation, and mutational bias:

- **Bacteria: Extremes range from as low as 13% in the endosymbiont Zinderia insecticola to as high as 75% in Anaeromyxobacter dehalogenans. Actinobacteria are notably GC-rich, averaging over 70%.**
- **Plants: Monocots exhibit a broad range; grasses (Poaceae) are often GC-rich (up to ~49%), while holocentric clades like Cyperaceae are GC-poor (~33.6%).**
- **Insects: Some bee-flies (Bombylius species) have extremely AT-rich genomes with genome-wide GC content as low as 26% and third-codon position GC (GC3) dropping to 12.6%.**
- **Human Genome: While the overall average is 40.9%, specific regions like** CpG islands **can exceed 60% GC, often serving as transcription regulatory sites.**

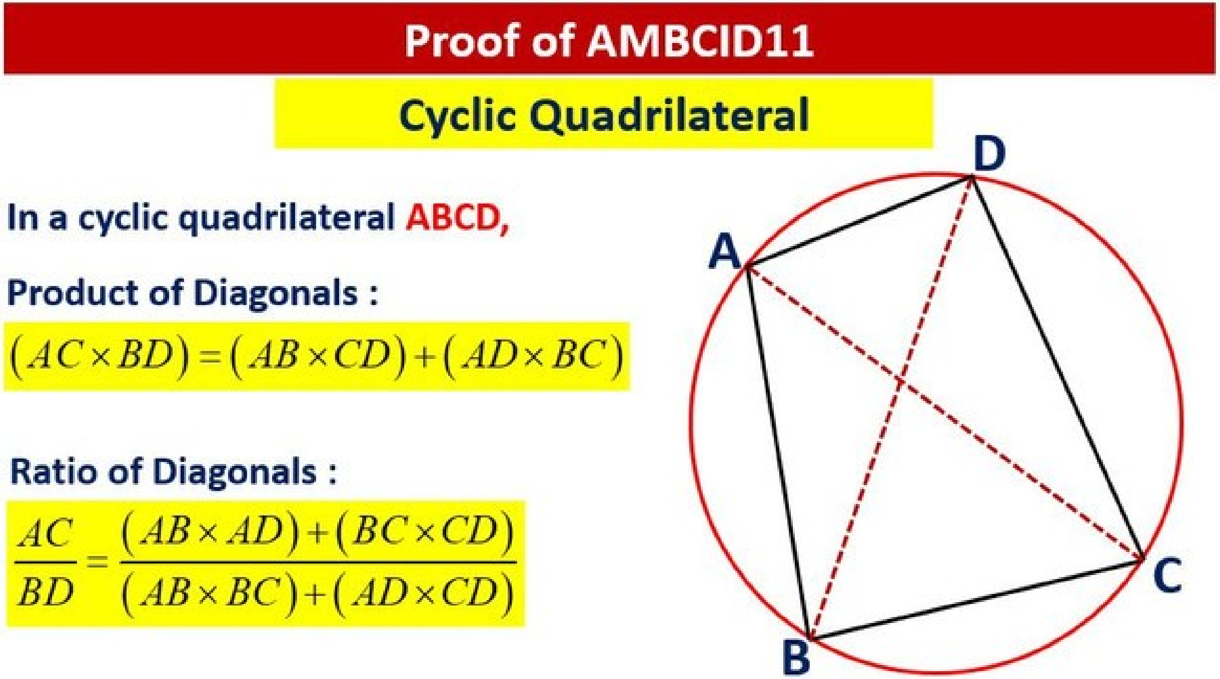
Distance properties:

mean line segment length	$\bar{s} = \frac{8(\pi-2)a}{\pi^2}$

(where lengths and areas refer to line segments and triangles picked at random from points on the curve)



Bloch-Sphere to SemiCircle PROJ.



Proof of AMBCID11

Cyclic Quadrilateral

In a cyclic quadrilateral ABCD,

Product of Diagonals :

$$(AC \times BD) = (AB \times CD) + (AD \times BC)$$

Ratio of Diagonals :

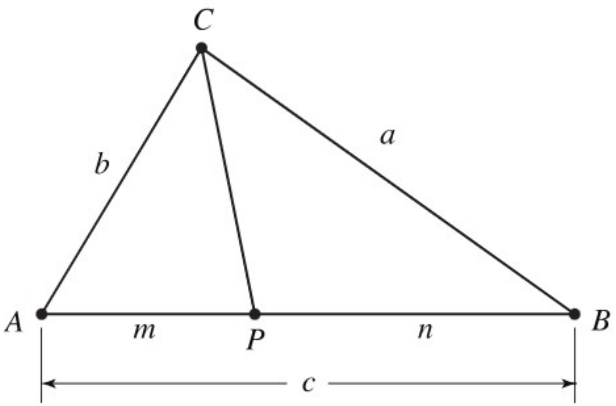
$$\frac{AC}{BD} = \frac{(AB \times AD) + (BC \times CD)}{(AB \times BC) + (AD \times CD)}$$

CpG island

A CpG island is an area of the genome that has an elevated frequency of CpG sites, or instances of consecutive cytosine and guanine nucleotides. CpG islands occur frequently in promoters and at the start of transcription regions in many eukaryotes, and the identification of CpG islands is an important algorithmic problem when looking for coding regions of genes. The "p" in "CpG island" represents the phosphodiester bond that joins the adjacent cytosine and guanine nucleotides in a strand of nucleic acid.

- **CpG site**
- A CpG site on a genome is the term applied to cytosine and guanine appearing consecutively on the same strand of nucleic acid (the "p" stands for the phosphodiester bond joining the two nucleotides).
- CpG sites are of practical interest because (especially in mammals), DNA methylation occurs very commonly on the cytosine belonging to the CG-pair, which serves as a key step in gene regulation by turning certain genes off.
- Furthermore, when CpG sites occur frequently in a region of the genome, the region is called a CpG island. These regions appear frequently at the start of promoters in eukaryotes and generally can indicate the presence of a coding region.

Stewart's Theorem



Let a Cevian $P\,C$ be drawn on a triangle $\Delta\,A\,B\,C$, and denote the lengths $m = \overline{P\,A}$ and $n = \overline{P\,B}$, with $c = m + n$. Then Stewart's theorem, also called Apollonius' theorem, states that

$$m\,a^2 + n\,b^2 = (m+n)\,\overline{P\,C}^2 + m\,n^2 + n\,m^2.$$

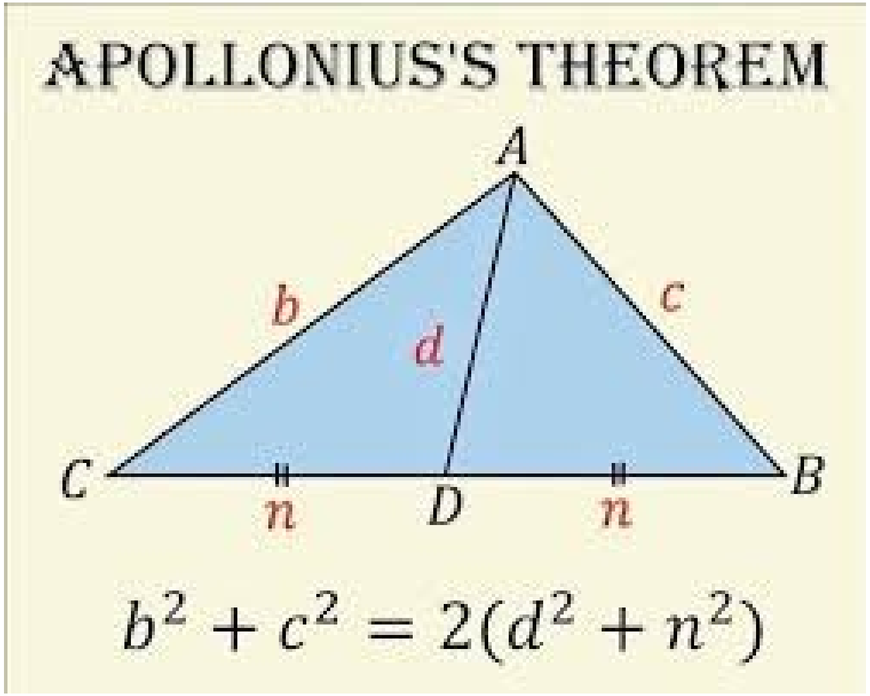
In particular, if k is the fraction of the distance of P from vertex A to vertex B and $k' = 1 - k$, then $m = k\,c$, $n = k'\,c$, and

$$\overline{P\,C}^2 = a^2\,k - \left(c^2\,k - b^2\right)k',$$

giving the above identity.

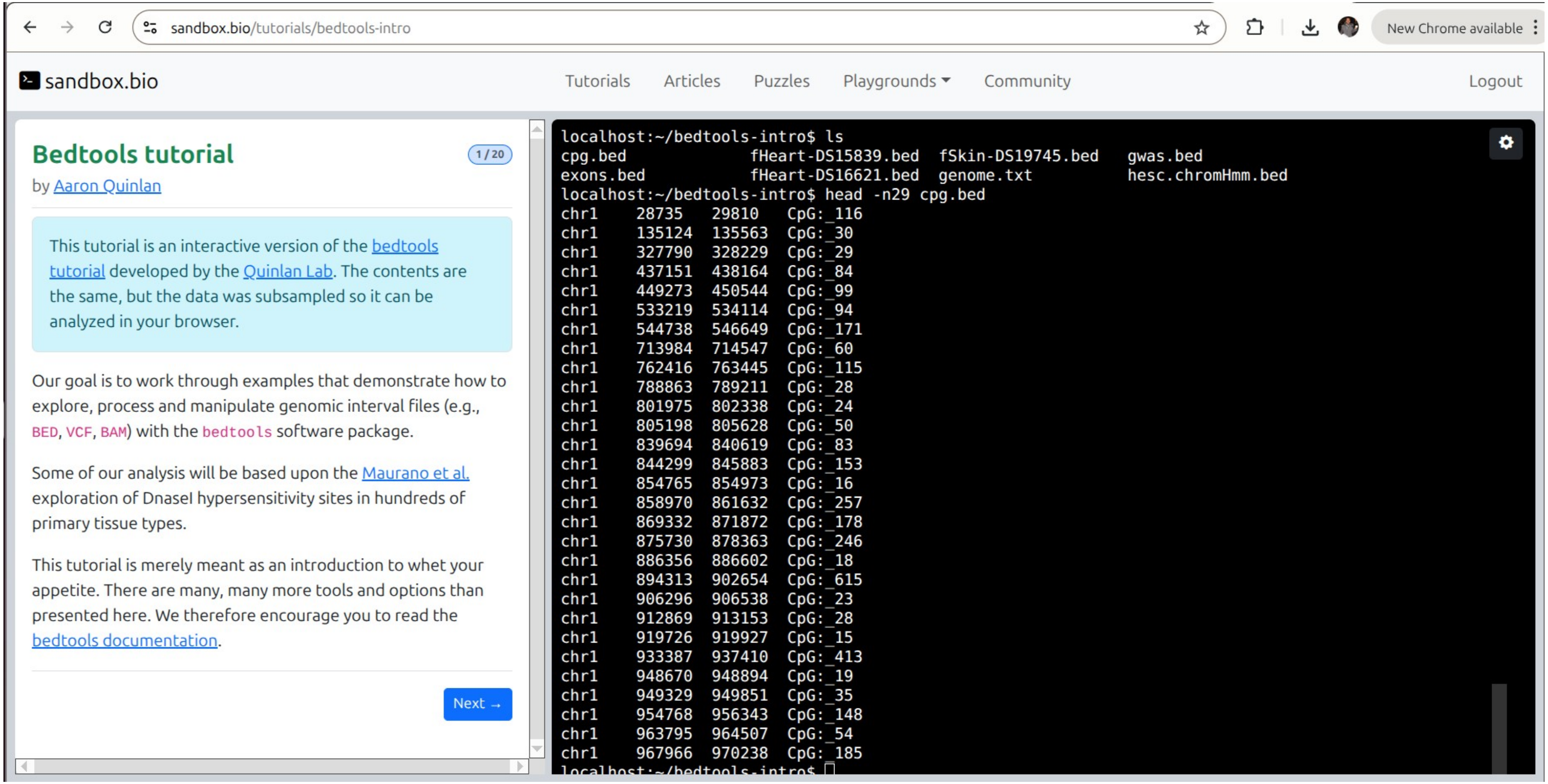
Bottema (1979) extended the formula to simplices in higher dimensions, and Bottema (1980-1981) explicitly considered the tetrahedron.

APOLLONIUS THEOREM MED#



$$b^2 + c^2 = 2(d^2 + n^2)$$

WWW.SANDBOX.BIO



Bedtools tutorial

by Aaron Quinlan

This tutorial is an interactive version of the bedtools tutorial developed by the Quinlan Lab. The contents are the same, but the data was subsampled so it can be analyzed in your browser.

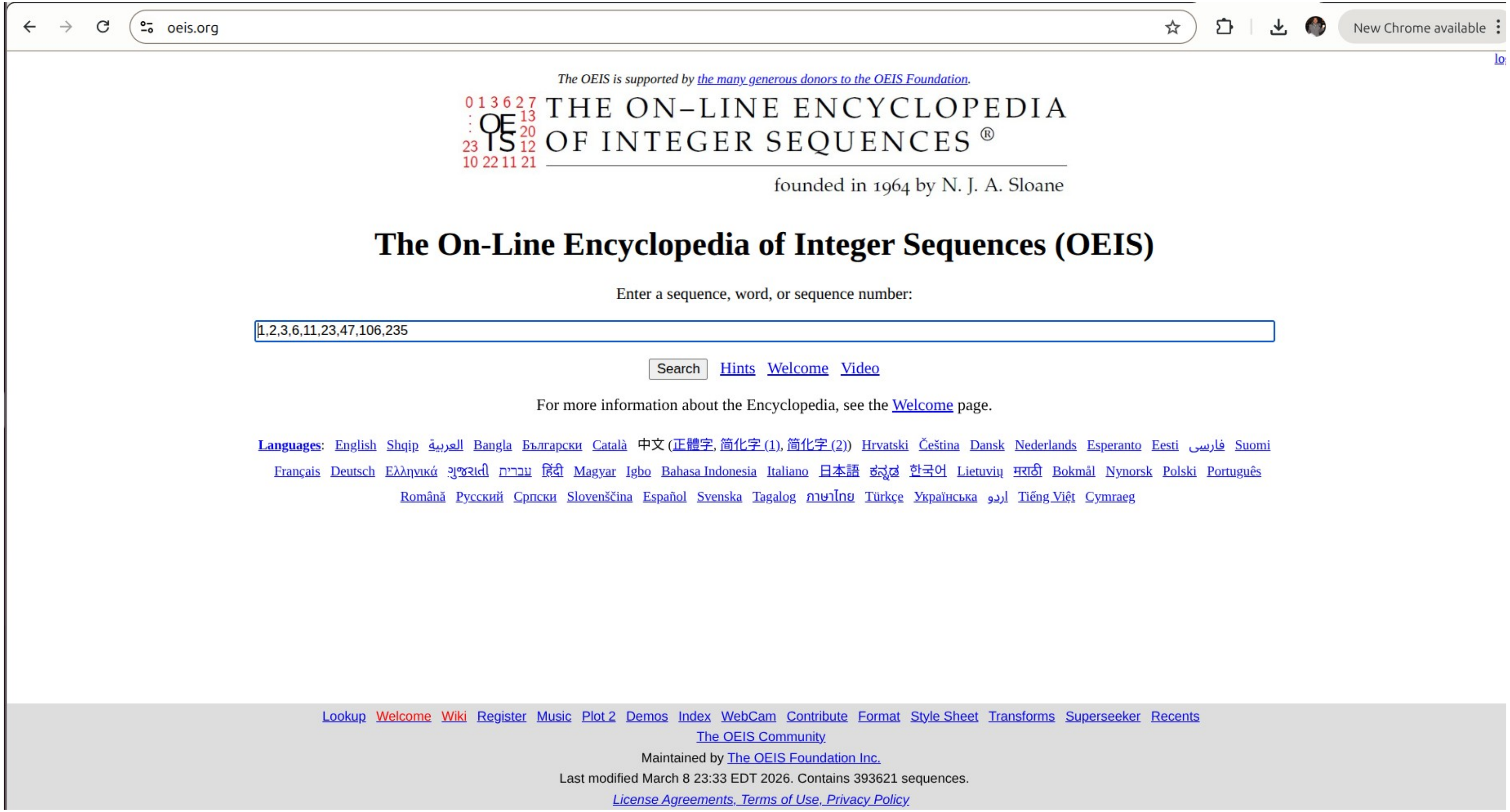
Our goal is to work through examples that demonstrate how to explore, process and manipulate genomic interval files (e.g., `BED`, `VCF`, `BAM`) with the `bedtools` software package.

Some of our analysis will be based upon the Maurano et al. exploration of DnaseI hypersensitivity sites in hundreds of primary tissue types.

This tutorial is merely meant as an introduction to whet your appetite. There are many, many more tools and options than presented here. We therefore encourage you to read the bedtools documentation.

```
localhost:~/bedtools-intro$ ls
cpg.bed            fHeart-DS15839.bed  fSkin-DS19745.bed   gwas.bed
exons.bed          fHeart-DS16621.bed  genome.txt          hesc.chromHmm.bed
localhost:~/bedtools-intro$ head -n29 cpg.bed
chr1    28735   29810   CpG:_116
chr1    135124  135563  CpG:_30
chr1    327790  328229  CpG:_29
chr1    437151  438164  CpG:_84
chr1    449273  450544  CpG:_99
chr1    533219  534114  CpG:_94
chr1    544738  546649  CpG:_171
chr1    713984  714547  CpG:_60
chr1    762416  763445  CpG:_115
chr1    788863  789211  CpG:_28
chr1    801975  802338  CpG:_24
chr1    805198  805628  CpG:_50
chr1    839694  840619  CpG:_83
chr1    844299  845883  CpG:_153
chr1    854765  854973  CpG:_16
chr1    858970  861632  CpG:_257
chr1    869332  871872  CpG:_178
chr1    875730  878363  CpG:_246
chr1    886356  886602  CpG:_18
chr1    894313  902654  CpG:_615
chr1    906296  906538  CpG:_23
chr1    912869  913153  CpG:_28
chr1    919726  919927  CpG:_15
chr1    933387  937410  CpG:_413
chr1    948670  948894  CpG:_19
chr1    949329  949851  CpG:_35
chr1    954768  956343  CpG:_148
chr1    963795  964507  CpG:_54
chr1    967966  970238  CpG:_185
localhost:~/bedtools-intro$ 
```

QML-”BLAT” from OEIS DataBase



The OEIS is supported by the many generous donors to the OEIS Foundation.

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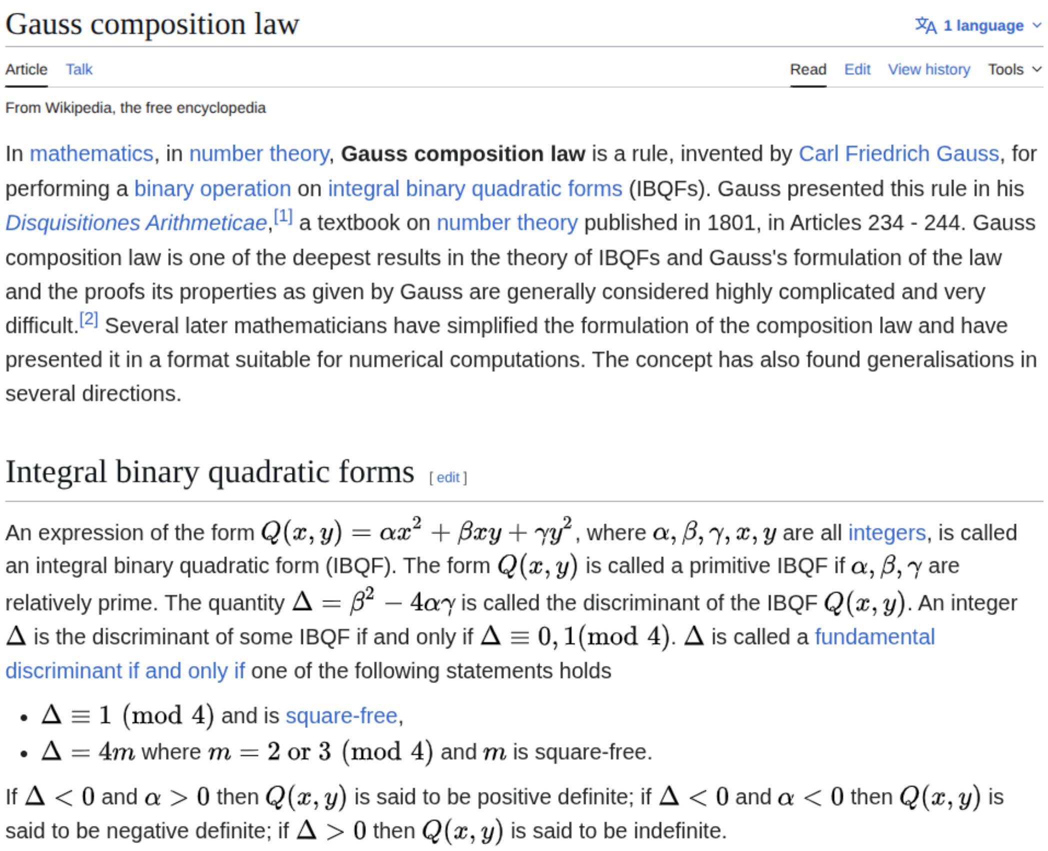
Manjul Bhargava (GCL)



Gauss composition law

From Wikipedia, the free encyclopedia

In mathematics, in number theory, **Gauss composition law** is a rule, invented by Carl Friedrich Gauss, for performing a binary operation on integral binary quadratic forms (IBQFs). Gauss presented this rule in his *Disquisitiones Arithmeticae*,[1] a textbook on number theory published in 1801, in Articles 234 - 244. Gauss composition law is one of the deepest results in the theory of IBQFs and Gauss's formulation of the law and the proofs its properties as given by Gauss are generally considered highly complicated and very difficult.[2] Several later mathematicians have simplified the formulation of the composition law and have presented it in a format suitable for numerical computations. The concept has also found generalisations in several directions.

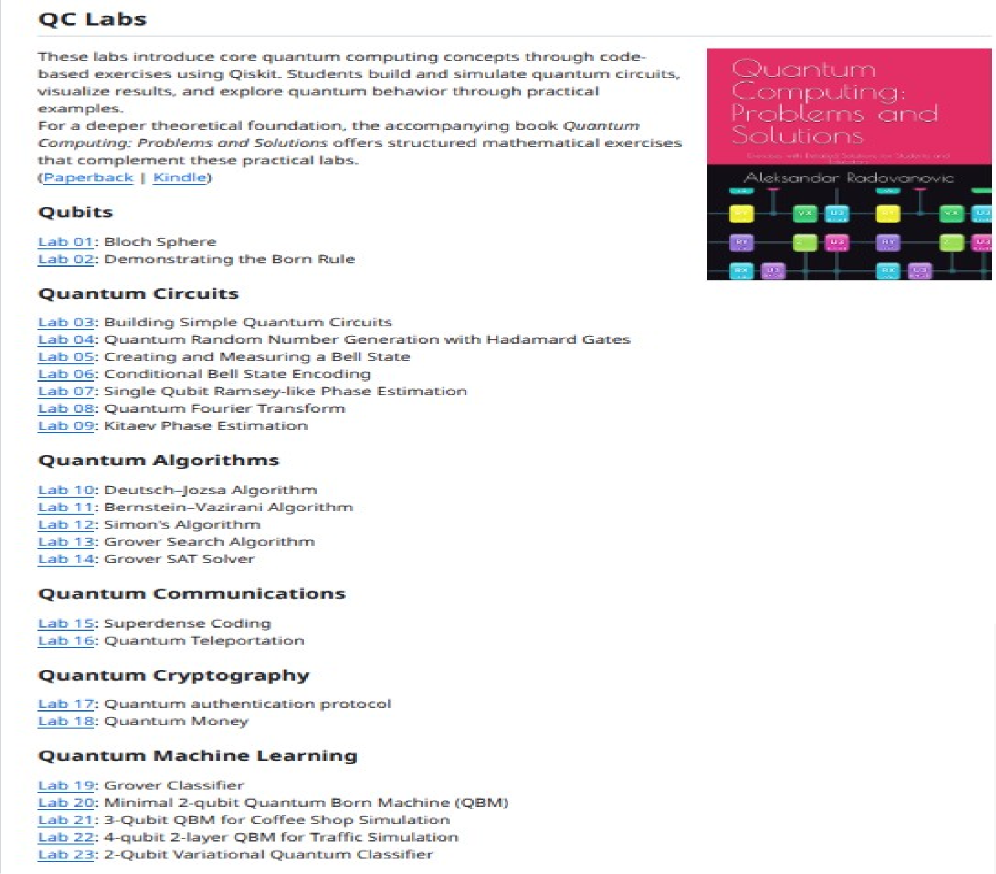
Integral binary quadratic forms [edit]

An expression of the form $Q(x,y) = \alpha x^2 + \beta xy + \gamma y^2$, where $\alpha, \beta, \gamma, x, y$ are all integers, is called an integral binary quadratic form (IBQF). The form $Q(x,y)$ is called a primitive IBQF if α, β, γ are relatively prime. The quantity $\Delta = \beta^2 - 4\alpha\gamma$ is called the discriminant of the IBQF $Q(x,y)$. An integer Δ is the discriminant of some IBQF if and only if $\Delta \equiv 0, 1 (\mathrm{mod}\ 4)$. Δ is called a fundamental discriminant if and only if one of the following statements holds

- $\Delta \equiv 1 \pmod 4$ and is square-free,
- $\Delta = 4m$ where $m = 2 \text{ or } 3 \pmod 4$ and m is square-free.

If $\Delta < 0$ and $\alpha > 0$ then $Q(x,y)$ is said to be positive definite; if $\Delta < 0$ and $\alpha < 0$ then $Q(x,y)$ is said to be negative definite; if $\Delta > 0$ then $Q(x,y)$ is said to be indefinite.

https://www.mendeley.com/reference-manager/library/collections/86898979-59ae-4628-8128-ba63c049170d/all-references/



QC Labs

These labs introduce core quantum computing concepts through code-based exercises using Qiskit. Students build and simulate quantum circuits, visualize results, and explore quantum behavior through practical examples.
For a deeper theoretical foundation, the accompanying book *Quantum Computing: Problems and Solutions* offers structured mathematical exercises that complement these practical labs.
(Paperback | Kindle)

Qubits

Lab 01: Bloch Sphere
Lab 02: Demonstrating the Born Rule

Quantum Circuits

Lab 03: Building Simple Quantum Circuits
Lab 04: Quantum Random Number Generation with Hadamard Gates
Lab 05: Creating and Measuring a Bell State
Lab 06: Conditional Bell State Encoding
Lab 07: Single Qubit Ramsey-like Phase Estimation
Lab 08: Quantum Fourier Transform
Lab 09: Kitaev Phase Estimation

Quantum Algorithms

Lab 10: Deutsch–Jozsa Algorithm
Lab 11: Bernstein–Vazirani Algorithm
Lab 12: Simon's Algorithm
Lab 13: Grover Search Algorithm
Lab 14: Grover SAT Solver

Quantum Communications

Lab 15: Superdense Coding
Lab 16: Quantum Teleportation

Quantum Cryptography

Lab 17: Quantum authentication protocol
Lab 18: Quantum Money

Quantum Machine Learning

Lab 19: Grover Classifier
Lab 20: Minimal 2-qubit Quantum Born Machine (QBM)
Lab 21: 3-Qubit QBM for Coffee Shop Simulation
Lab 22: 4-qubit 2-layer QBM for Traffic Simulation
Lab 23: 2-Qubit Variational Quantum Classifier

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NOESIS
quantum superintelligence

Project Noesis: Quantum Superintelligence

Project Noesis(1) operates at the intersection of quantum computing and advanced artificial intelligence, exploring how quantum processes could enable forms of intelligence that surpass the limits of classical computation.

The project is driven by the hypothesis that consciousness and awareness originate at the quantum level, deeper than neural activity alone. The ultimate goal of Project Noesis is to create quantum superintelligence with adaptive reasoning, autonomous decision-making, and self-awareness.

We envision a future where quantum superintelligence exceeds human capabilities across scientific, technological, and societal domains, creating a new era of transformative discovery and progress.

Contact us

MY BASE PAPER FOR THIS WORK

SELF – CITATION ---

Chauhan, R. S., Thakur, S., & Kanchinadham, S. P. S. (2026). Overall Synonymous Codon Usage Bias strongly Correlates with Codome Core Length anent Harmonic Mean based Computation of Kullback-Leibler Divergence in an ECA-QCA System. https://doi.org/10.5281/zenodo.19200298

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