



# Eugene Yuta Bann

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**Computer Scientist and Natural Language Processing (NLP) expert.**  
Pioneer of Emotion-Based Conversation AI and a meticulous systems architect with an extensive software engineering background.  
Experienced Founder/CTO, mentor, and consultant, with a passion for algorithmic solutions and working with others.

## Technical Proficiency

Python	10 Years	★★★★★
NLP	10 Years	★★★★★
Conversation AI	7 Years	★★★★★
MySQL/Server	12 Years	★★★★★
UNIX/Bash	10 Years	★★★★
PHP/XHTML/CSS	15 Years	★★★★
AWS	8 Years	★★★★
LaTeX	8 Years	★★★★
JavaScript	8 Years	★★★
Apache Server	5 Years	★★★
Java	5 Years	★★★
VBA	5 Years	★★
Ruby	2 Years	★★
C/C++	2 Years	★
FORTAN	1 Year	★

## Academia

**BSc (Honours) Computer Science**  
University of Bath, United Kingdom

Published several papers with Joanna J. Bryson:

- o **The Conceptualisation of Emotion Quality: Semantic Clustering of Emotional Tweets, In proceedings of the 13th Neural Computation and Psychology Workshop (NCPW13);**
- o **Measuring Cultural Relativity of Emotional Valence and Arousal using Semantic Clustering and Twitter, In proceedings of the 35th Annual Meeting of the Cognitive Society (CogSci 2013).**

Lectured on website security, teaching topics including: SQL injection; XSS; Session Fixation; Google hacking; Passwords; Cookie Poisoning; Social Engineering; and Black Box Testing.

## Interests & Achievements

**Interests:** the intersection of AI, Philosophy, Quantum Mechanics and Psychology; specifically, simulation theory, human-like consciousness, and machine morality.

**Achievements:** acclaimed by global media including The Guardian, The New Yorker, and Business Insider; won MEDy prize at Exponential Medicine 2015; televised on the BBC, Reuters, Lebanese state TV, and Planète+; keynote speaker at Applied AI Conference 2016; guest lecturer at MIT 2017.

**Activities:** professional tennis player until 2007; semi-pro DJ, jazz pianist, and D&B music producer; high performance driving; mountain biking; skiing; extreme hiking; marksmanship; archery; Jujutsu; and (although it's been a while) flying airplanes.

## Professional Experience

Head of Software Jul 2019 – Jan 2021

**Toi Labs** – San Francisco, CA, USA

- Architected and built the company's first fully-functional software stack – back-end (on-board RPI software, server architecture/software, database, etc) and front-end (web interface, UI/UX, data visualization, etc) – that enabled over 150 smart toilet seat prototypes to be installed and used.
- Designed and implemented several novel image processing algorithms (using OpenCV and scikit-image) that detected custom color palettes (normalized to lighting conditions), edges, and size (normalized to toilet geometry) of excreta (F1>0.8), used in statistical models and combined with ML.
- Engineered the ML pipeline that enabled the extraction and storage of characteristic biomarkers; analysis, visualization, and feedback of data; modelling and prediction of adverse toileting events.
- Amongst other things: designed and implemented a data labelling and exploration console; statistical modelling; clinical research and grant writing; neural network development; engineer mentoring.

Founding Team Member and Chief Technical Officer Dec 2017 – Dec 2018

**Primed** – San Francisco, CA, USA

- Architected a general conversation AI using a cognitive hypergraph integrated with over 20 knowledgebase sources, including DBpedia, Wikipedia, NELL, FrameNet, Yago, and ConceptNet.
- Built the initial HW prototype for the AI (child's toy) within 2 weeks, using an RPI Zero, a stuffed bunny, OTS components, and implementing customized voice synthesis (Acapela) and recognition (Google).
- In addition to the stack, created upper taxonomies, comprehensive gold-standard conversational phrase lists, and associated novel data structures for Q&A, reply generation, antecedent tracking, rhetoric detection, intent classification, emotion, and behaviour activation (of HW robotics).

Founder and Chief Technical Officer Oct 2014 – Oct 2017

**X2AI** – NASA Ames, Moffett Federal Field, CA, USA

- Designed and created **Tess**, a conversational AI psychotherapist that recognizes and reacts to emotions, including: system architecture; NLP algorithms; the emotion algorithm; multi-lingual functionality; data I/O; SMS and IM integration; AI learning, memory, and autonomy sub-routines; psychological mechanisms for conversation flow; and an extremely elaborate front-end system.
- Architected and built all X2AI technology, securing \$1.25m funding and clients including Nemours, St. Elizabeth Healthcare, and RadboudUMC. Also deployed Tess in Lebanon, for Syrian refugees.
- Designed and implemented over 30k phrases, 100 conversation modules and the world's most comprehensive lexical emotion taxonomy; combined these within a naturally complex, human-like flow, without the need to train an ML algorithm with, nor collect, sensitive (PHI) conversation data.
- Complete MySQL administration, including data architecture/structure/schema; normalisation (DKNF); diagrams (>100 tables); SQL formulation; server redundancy; performance tuning.
- Amongst other things: created all websites; closely liaised with clinicians; implemented network security; enforced healthcare data compliance (HIPAA); architected fault tolerance protocols.

Quantitative Software Engineer Aug 2014 – Aug 2015

**Valuation Metrics** – San Francisco, CA, USA

- Enabled public companies to make more effective spend decisions through predictive M&A analysis; improved the speed, precision, and recall of Modern Portfolio Theory-based algorithms.
- Automated the analysis of underlying financial fundamentals; developed complex front- and back-end web dashboards; extensive ad-hoc software engineering, testing, and code review.

Analyst, Global External Marketing Efficiencies Nov 2012 – Jul 2014

**Vistaprint** – Barcelona, Spain

- Achieved ~98% accuracy for full-quarter channel forecasts (including "polluted" channels), by performing trend-based modelling, multivariate regression, and time series analyses (Holt Winters).
- Directed over \$11 million of quarterly spending, conducting CoB analyses, attribution modelling, consumer profiling, and big data mining (T-SQL). Lead SQL trainer for the Global Analytics team.

Freelance Engineer and Consultant Sep 2005 – Aug 2012; H1 2021

**Selected Projects** – London, UK; Bath, UK; Tracy, CA, USA

- Upgraded **Horstman Defence Systems'** hardware, software, and network infrastructure; implemented and analyzed social experiments for **Experian**; conducted consumer profiling for **GSK**.
- Built an off-grid government data collection system, an automated apartment rental system, and a multilingual social network (**Ernst & Young** sustainability award winner).
- Implemented an automated FOREX trading algorithm using NLP and multiple news feeds.
- Designed and implemented an automated lyrics generator using ML (GPT-2) and NLP components.
- Created novel conversation flows and large phrasal datasets using GPT-3 Prompt Engineering.