EMBASSY OF THE UNITED STATES OF AMERICA
美国驻华大使馆 - 北京市朝阳区安家楼路 55 号
BEIJING, CHINA – NONIMMIGRANT VISA UNIT / 非移民签证处
https://china.usembassy-china.org.cn/embassy-consulates/beijing/

221(g) 行政审理单

This 221(g) letter is valid for exactly ONE YEAR from the date it is issued.
221(g)审理单自签发之日起一年内有效。

Dear Applicant: Your application has been refused under Section 221(g) of the Immigration and Nationality Act of 1952. Please be advised that for U.S. visa purposes, including ESTA (https://esta.cbp.dhs.gov/esta/), this decision constitutes a denial of a visa. This refusal may be overcome without filing another visa application once you present the required additional evidence. **ALL MATERIALS MUST BE IN ENGLISH.** Additional processing may take four weeks or longer.

尊敬的申请人：根据 1952 年《移民及国籍法》的 221(g)条款，您的签证被拒签了。对于美国签证申请者来说，包括通过旅游授权电子系统的旅客，即 ESTA（https://esta.cbp.dhs.gov/esta/），根据该条款所作的决定等同于签证被拒。如您能尽快提供补充资料，则不需要重新填写新的签证申请表格，继续进行审理。**所有补充材料必须为英文版本。**行政审理可能需要四周或者更长的时间。

☑	Detailed CV or resume, including a list of publications 详细的英文个人简历，包括所有出版物的清单 Sample resume 简历范本 https://photos.state.gov/libraries/china/196482/PDF%20File/Resume%20Sample_English.pdf	☑	Complete itinerary, including all meetings, conferences, and visits; include names, addresses, and telephone numbers of your hosts 完整的在美行程，包括所有要参加的会议、谈判和访问，以及接待方的名称、地址和电话
☐	Detailed CV or resume of research advisor in the U.S., including email address and a list of publications 在美导师的个人简历，包括电子邮件、出版物清单	☐	Invitation letter(s) from business, conference, or school, including abstract of paper (if applicable) 商务 / 会议 / 学校 邀请信，包括文章摘要（如适用）
☐	Research and/or training plan and details of course of study 研究和（或）培训计划以及学习的具体课程	☐	Current enrollment letter and/or official transcript 当前的注册证明和（或）学校正式成绩单
☐	Proof of SEVIS fee payment 已付 SEVIS 费的证明 (www.fmjfee.com)	☐	Court / Police / Legal documents relating to your situation 由法院 / 警察局 / 律师出具的与您情况相关联的材料
☑	Detailed description of your job / company / equipment for purchase, including end uses and users 关于您职务 / 公司 / 将要购买的设备，包括设备用途及用户的详细说明	☐	Proof of relationship (invite letter, birth certificate, marriage certificate, copy of U.S. inviter's visa / green card / naturalization record/ U.S. passport) 关系证明（往来的信件、出生证、结婚证、美方邀请人的签证 / 绿卡 / 公民证 / 护照的复印件）
☐	Previous passport(s) / visas and/or evidence of U.S. stay and extension 以前的护照 / 签证（或）在美国延期的证明	☐	**OTHER / 其它**

☑ Please EMAIL this green form, the requested information, your date of birth, and a Chinese phone number to ***beijingvisaapp@state.gov*** with the subject line "LAST NAME, FIRST NAME – PASSPORT NUMBER – DS-160 CONFIRMATION BARCODE" Attachments must be in MS Word, PDF, or JPEG format. If you do not receive an automatic reply email acknowledging receipt of your email, it means we did not receive your email. In this case, please try re-sending your attachments from a different email address.

请将此绿色的表格、所需资料、您的出生日期和中国大陆电话发送电子邮件到 ***beijingvisaapp@state.gov***。邮件标题栏请以如下格式书写"姓，名－护照号码－DS-160 确认页的条形码" 邮件附件必须是 MS Word、PDF 或 JPEG 格式。如果您未收到自动回复，这表明事实上我们并没有收到您的邮件。在这种情况下，请您尝试使用不同的邮箱再次发送带有附件的邮件。

☐ Regardless of where you interviewed, please bring this letter with your valid, personal ID and requested items to the Embassy ***(No. 55 An Jia Lou Road)*** for an interview 面谈 / to provide fingerprints 提供指纹 / pay relevant visa fees 支付相关签证费. You do not need to make an appointment or pay the application fee again. Please note you will ***ONLY*** be allowed entry to the Embassy consular section on a Monday, Tuesday, Thursday or Friday ***during the hours circled below***.
Please visit ***http://beijing.usembassy-china.org.cn/nivclosure.html*** to confirm the Embassy is open.

请带好本页信函，有效身份证件以及所需标注的英文资料亲自到大使馆(**朝阳区安家楼路 55 号**)面谈/提供指纹/支付相关签证费。**您无需重新预约或再次支付申请费用。**请务必于周一，周二，周四或周五下面标注的时间段入馆。请提前上网查看使馆工作时间，我们的网址：***http://beijing.usembassy-china.org.cn/nivclosure.html***。

8:00am-10:00am（上午 8:00-10:00）　　2:00pm-4:00pm（下午 14:00-16:00）

NAME (名字): Kai Zhen　　PASSPORT # (护照号码): EJ5248220

March 31, 2023

Attn: U.S. Masters Cap

U.S. Citizenship and Immigration Services

RE: H-1B Petition for Nonimmigrant Worker

Petitioner:	**Amazon.com Services LLC ("Amazon"), a wholly-owned subsidiary of Amazon.com, Inc.**
Beneficiary:	**ZHEN, Kai**
Offered Position:	**Applied Scientist II**

Dear Sir or Madam:

Amazon submits this letter in support of its H-1B nonimmigrant petition on behalf of the above Beneficiary.

I. Background

The above listed petitioner is a subsidiary of Amazon.Com, Inc., and is fully integrated into the Amazon.com, Inc. family of companies. Amazon.com, a Fortune 100 company based in Seattle, Washington, opened its virtual doors on the World Wide Web in July 1995, and today offers Earth's Biggest Selection. Amazon.com seeks to be the world's most customer-centric company, where customers can find and discover anything they might want to buy online. Amazon.com and sellers list millions of unique new and used items in categories such as digital media, electronics, computers, kitchen products and housewares, books, music, DVDs, videos, camera and photo items, toys, baby and baby registry, software, computer and video games, cell phone and service, tools and hardware, travel services, magazine subscriptions and outdoor living items. Amazon.com also designs, manufactures, markets, and sells a wireless e-reading device called Amazon Kindle, and is a leading cloud computing provider. Through Amazon Marketplace, any business or individual can sell virtually anything to Amazon.com's millions of customers, and with Amazon.com Payments, sellers can accept credit card transactions, avoiding the hassles of offline payments. Through December 31, 2022, the company employed approximately 1,541,000 employees worldwide, with gross revenue of more than $513 Billion (Gross profit).

Amazon.com invests substantially in the U.S. economy and drives job creation. Through its investment of more than $350 billion over the past decade, Amazon.com has created over 800,000 full- and part-time jobs in the U.S. In addition, by investing in areas like construction, logistics, and professional services, the company has indirectly created more than 780,000 jobs. Amazon.com has also helped create and support another 1.1 million jobs through the small and medium-sized businesses that sell items on our website. Amazon.com delivers items to customers through our vast logistics network, which is supported by a broad range of jobs including package stowers, warehouse managers, mechanics, and software development engineers, among many others.

II. The Beneficiary is Eligible for H-1B Status

A. Amazon Offers a Professional Specialty Occupation

In the offered position, the Beneficiary will participate in the design, development, evaluation, deployment and updating of data-driven models and analytical solutions for machine learning (ML) and/or natural language (NL)

applications. Duties will include: develop and/or apply statistical modeling techniques (e.g. Bayesian models and deep neural networks), optimization methods, and other ML techniques to different applications in business and engineering; routinely build and deploy ML models on available data; research and implement novel ML and statistical approaches to add value to the business; and mentor junior engineers and scientists.

This position requires at least a Bachelor's Degree or foreign equivalent in Computer Science, Computational Engineering, Machine Learning, Statistics, or related field.

B. The Beneficiary is Qualified for the Offered Position

The Beneficiary is qualified to assume this professional position by virtue of the Beneficiary's formal education. The Beneficiary holds a minimum of a bachelor's degree or the equivalent in a related field. Please see attached copies of educational certificates.

III. Amazon's H-1B Petition Should be Approved

Amazon's H-1B petition on behalf of the Beneficiary should be approved. The position that Amazon offers is a professional specialty occupation requiring at least a Bachelor's degree in a specific field of study as its minimum requirement. The Beneficiary has the requisite credentials to fill this position. During the period of employment, Amazon will abide by the terms and conditions of the Labor Condition Application certified by the U.S. Department of Labor for this petition.

Thank you for your kind and favorable adjudication of this petition.

Very truly yours,

Daniel Van Den Handel
HR Immigration

KAI ZHEN

http://kaizhen.us • kaizhen723@gmail.com

EMPLOYMENT

Full-Time

Amazon.com, Inc.

- Applied Scientist II
  - Alexa Speech, Pittsburgh, PA — Apr. 2021 – present
    - Conducted development and deployment of data-driven Alexa speech applications
    - Applied optimization methods to improve the runtime efficiency for Alexa speech products

Internship

Amazon.com, Inc.

- Applied Scientist Intern
  - Alexa Speech, Pittsburgh, PA — Summer 2020
    - Project: Network Compression for On-Device Speech Recognition
      <Best Internship Poster Presentation>

LinkedIn Corporation

- Machine Learning & Relevance Intern
  - Ads-AI Group, Mountain View, CA — Summer 2019
    - Project: Ads Response Rate Prediction with Language Model Enriched Semantic Features
  - Company Standardization Group, New York City, NY — Summer 2018
    - Project: Relevance Ranking Using Recurrent Neural Network for LinkedIn Resume Builder

Academic Part-Time

Indiana University — Aug. 2015 – Mar. 2021

- Research Assistant: Audio Signal Analysis/Synthesis Technology Based on Machine Learning
  - Published in leading machine learning and speech processing conferences and journals
  - Contributed to 5 US patents as an inventor
- Associate instructor in Department of Computer Science and Intelligent Systems Engineering

EDUCATION

Ph.D., dual major in Computer Sciences and Cognitive Science — May. 2021

- Indiana University, Bloomington, United States
- Committee: Minje Kim (chair, IU Intelligent Systems Engineering), Robert Goldstone (co-chair, IU Cognitive Science), Donald Williamson (IU Computer Science), and Shen Yi (U. of Washington, Speech and Hearing Sciences)
- Dissertation: "Neural Waveform Coding: Scalability, Efficiency and Psychoacoustic Calibration"
  <Winner of the Outstanding Research Award (IU Cognitive Science)>

M.S., major in Computer Science — Jul. 2015

- Tsinghua University, Beijing, China

B.S., major in Software Engineering — Jul. 2012

- Xidian University, Xi'an, China

PROFESSIONAL ACTIVITIES

Conference Reviewer

- IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP): 2019 - 2024
- ISCA Interspeech: 2022 - 2023
- EURASIP European Signal Processing Conference (EUSIPCO): 2022 - 2023
- IEEE Workshop on Applications of Signal Processing to Audio and Acoustics (WASPAA): 2021 - 2023
- IEEE International Conference on Data Mining (ICDM): 2020
- Association for the Advancement of Artificial Intelligence (AAAI): 2017 - 2018

Journal Reviewer

- European Association for Signal Processing (EURASIP) Journal on Audio, Speech, and Music Processing
- IEEE MultiMedia
- Speech Communication

PUBLICATIONS

International Journal Articles

[J002] **Kai Zhen**, Jongmo Sung, Mi Suk Lee, Seungkwon Beack, and Minje Kim, "Scalable and Efficient Neural Speech Coding: A Hybrid Design", *IEEE/ACM Transactions on Audio, Speech, and Language Processing **(IEEE/ACM TASLP), 30 (2021): 12-25.***

- ***This is an extended version of [C001] and [C003].***

[J001] **Kai Zhen**, Mi Suk Lee, Jongmo Sung, Seungkwon Beack, and Minje Kim, "Psychoacoustic Calibration of Loss Functions for Efficient End-to-End Neural Audio Coding," *IEEE Signal Processing Letters **(SPL) 27 (2020): 2159-2163.***

- ***We proposed a novel method to compress audio signals without degrading the quality. It can facilitate a faster data transmission and reduce energy cost. See the demo page.***

Referred International Conference Proceedings

[C008] Martin Radfar, Paulina Lyskawa, Brandon Trujillo, Yi Xie, **Kai Zhen**, Jahn Heymann, Denis Filimonov, Grant Strimel, Nathan Susanj, Athanasios Mouchtaris, "*Conmer: Streaming Conformer with no self-attention for interactive voice assistants*," *In Proc. Annual Conference of the International Speech Communication Association (**Interspeech**)*, Dublin, Ireland, August 21-24, 2023.

- ***We proposed an alternative model architecture to the state-of-the-art that can perform better on voice assistants.***

[C007] **Kai Zhen**, Martin Radfar, Hieu Duy Nguyen, Nathan Susanj, Grant Strimel, Athanasios Mouchtaris, "*Sub-8-bit Quantization for On-Device Speech Recognition: A Regularization-Free Approach*", *IEEE Workshop on Spoken Language Technology (**IEEE SLT**)*, Doha, Qatar, January 9-12, 2023.

- ***This is an improved version of [C006]. The neural efficiency optimization method is model-agnostic, which can be easily adopted in multiple locales, device types, and architectures.***

[C006] **Kai Zhen**, Hieu Duy Nguyen, Raviteja Chinta, Nathan Susanj, Athanasios Mouchtaris, Tariq Afzal, and Ariya Rastrow, *"Sub-8-Bit Quantization Aware Training for 8-Bit Neural Network Accelerator with On-Device Speech Recognition," in Proceedings of Annual Conference of the International Speech Communication Association (Interspeech),* Incheon, Korea, September 18-22, 2022.

- ***We proposed a quantization mechanism to compress speech recognition models by more than 5 times without hindering the accuracy. This helps Alexa run faster to improve customers' experience. The method in this work is also relevant to [C001] during my PhD studies.***

[C005] **Kai Zhen**, Hieu Duy Nguyen, Feng-Ju (Claire) Chang, Athanasios Mouchtaris, *"Sparsification via Compressed Sensing for Automatic Speech Recognition," in Proceedings of the IEEE International Conference on Acoustics, Speech, and Signal Processing (**ICASSP**)*, Toronto, ON, Canada, June 6-12, 2021.

- ***This is the outcome of my internship with Amazon Alexa. We used a compressed sensing inspired optimization method to prune / compress the model weights by more than 70%. It improves runtime efficiency.***

[C004] Haici Yang, **Kai Zhen,** Seungkwon Beack, Minje Kim, *"Source-Aware Neural Speech Coding for Noisy Speech Compression," in Proceedings of the IEEE International Conference on Acoustics, Speech, and Signal Processing (**ICASSP**)*, Toronto, ON, Canada, June 6-12, 2021.

- ***This work harmonized speech enhancement and coding in the latent space to generate source-specific representations.***

[C003] **Kai Zhen**, Mi Suk Lee, Jongmo Sung, Seungkwon Beack, and Minje Kim, "Efficient And Scalable Neural Residual Waveform Coding with Collaborative Quantization," *in Proceedings of the IEEE International Conference on Acoustics, Speech, and Signal Processing (**ICASSP**)*, Barcelona, Spain, May 4-8, 2020.

- ***On top of [C001], we introduced collaborative quantization to better allocate bit resources between linear predictive coding and residual coding.***

[C002] **Kai Zhen**, Mi Suk Lee, Minje Kim. "A Dual-Staged Context Aggregation Method towards Efficient End-To-End Speech Enhancement," *in Proceedings of the IEEE International Conference on Acoustics, Speech, and Signal Processing (**ICASSP**)*, Barcelona, Spain, May 4-8, 2020.

- ***We proposed a hybrid model to better remove the background noise (such as the one from humming birds and ocean waves) from the speech signals. The enhanced speech sounds more clear and natural. See the demo page.***

[C001] **Kai Zhen**, Jongmo Sung, Mi Suk Lee, Seungkwon Beack, and Minje Kim, "Cascaded Cross-Module Residual Learning towards Lightweight End-to-End Speech Coding," *in Proceedings of Annual Conference of the International Speech Communication Association (**Interspeech**)*, Graz, Austria, September 15-19, 2019.

- ***In this paper, we demonstrated a lightweight and scalable design to compress speech signals significantly without losing the intelligibility. This work is not only applicable to speech signals but also models for Alexa speech services. See the demo page.***

Patents

[P005] Kim, Minje, Mi Suk Lee, Seung Kwon Beack, Jongmo Sung, Tae Jin Lee, Jin Soo Choi, and **Kai Zhen**. "Apparatus and method for speech processing using a densely connected hybrid neural network." U.S. Patent Application 17/308,800, filed November 11, 2021.

- ***The innovation from this patent leads to [C002].***

[P004] Mi Suk Lee, Seung Kwon Beack, Jongmo Sung, Tae Jin Lee, Jin Soo Choi, Minje Kim, **Kai Zhen**, "Method and apparatus for processing audio signal," *US Patent App. 17/156,006*, 2021.

- ***The innovation from this patent leads to [J001].***

[P003] Minje Kim, **Kai Zhen**, Mi Suk Lee, Seung Kwon Beack, Jongmo Sung, Tae Jin Lee, Jin Soo Choi. "Residual coding method of linear prediction coding coefficient based on collaborative quantization, and computing device for performing the method." U.S. Patent Application 17/098,090, filed May 13, 2021.

- ***The innovation from this patent leads to [C003].***

[P002] Mi Suk Lee, Jongmo Sung, Minje Kim, **Kai Zhen,**, "Audio signal encoding method and audio signal decoding method, and encoder and decoder performing the same," U.S. Patent Application No. 16/543,095

- ***The innovation from this patent leads to [C001].***

[P001] Minje Kim, Aswin Sivaraman, **Kai Zhen**, Jongmo Sung, et al, "Audio signal encoding method and apparatus and audio signal decoding method and apparatus using psychoacoustic-based weighted error function", *US Patent Application*, US 2019 / 0164052 A1.

- ***With this innovation, we applied psychoacoustics to the training of speech enhancement models. By using psychoacoustic masks, it allows the occurrence of some noise that is inaudible to humans.***

SKILLS

Speech and audio processing: speech and audio coding, enhancement, recognition, source separation

Model compression and optimization: quantization, sparsification
Machine learning: recurrent neural network transducer, transformer, language modeling
Programming: Python, C, C++, MATLAB

HONORS, AWARDS & SCHOLARSHIP

Outstanding Research Award Apr. 2021

- Given by Cognitive Science Program at Indiana University

Top-Rated Intern Poster Aug. 2020

- Among 17 interns receiving the highest rate out of more than 180 participants

Summa Cum Laude Jul. 2012

- Graduate with honor from Xidian University

China National Scholarship Nov. 2010, Nov. 2011

- For the effort on maintaining top-tier GPA and mathematical contest in modeling (MCM)
