

# Peijie Chen

email: [peijie.chen.auburn@gmail.com](mailto:peijie.chen.auburn@gmail.com)

◇ web: <https://chanfeechen.github.io/resume/> ◇ cell: +1.334.400.9198

**Biography:** Peijie Chen completed his Ph.D. in the Department of Computer Science and Software Engineering at Auburn University. His passion for AI ignited after AlphaGo's historic win. With a strong background in signal processing, holding an undergraduate degree in Telecommunication Engineering and a Master's degree in Electrical Engineering, Peijie has delved into deep learning research, including object detection, explainable AI, and multi-modal learning. His academic journey combines rigorous engineering disciplines with a passion for the evolving field of AI technologies.

## EDUCATION

---

<b>Auburn University</b> , Auburn, AL Ph.D. in Computer Science under the supervision of Prof. <a href="#">Anh Nguyen</a> .	2018 - 2024
<b>Auburn University</b> , Auburn, AL M.S. in Electrical Engineering	2015 - 2017
<b>Shenzhen University</b> , Shenzhen, China B.S. in Telecommunication Engineering	2010 - 2014

## WORK EXPERIENCE

---

<b>Noteworthy AI Intern</b> <i>Machine Learning Engineer</i>	Jan 2024 - April 2024 <i>Connecticut, US</i>
---	---

- Developed object detection/segmentation models, defect detection algorithms, and depth measurements.
- Deployed models into production (Amazon SageMaker).
- Showcased product capabilities to potential clients.

<b>Auburn University</b> <i>Research Assistant</i>	Jan 2023 - Dec 2023 <i>Auburn University</i>
---	---

- Publication: [PEEB: Part-based Image Classifiers with an Explainable and Editable Language Bottleneck](#)
- Project: [Leveraging Habitat Information for Fine-grained Bird Identification](#)
- Project: [Co-Attention Bottleneck: Explainable and Causal Attention Emerged from Transformers Trained to Detect Images Changes](#)

<b>Noteworthy AI Intern</b> <i>Machine Learning Engineer</i>	Sep 2022 - Dec 2022 <i>Connecticut, US</i>
---	---

- Developed and enhanced object detection/segmentation and defect detection.
- Collaborated with the engineering team to deploy algorithms and models into production environments.

<b>Auburn University</b> <i>Research Assistant</i>	Aug 2021 - Aug 2022 <i>Auburn University</i>
---	---

- Publication: [gScoreCAM: What is CLIP looking at?](#)
- Project: [How explainable are adversarially-robust CNNs?](#)

- Project: [The shape and simplicity biases of adversarially robust ImageNet-trained CNNs](#)

**NSF Research Experiences for Undergraduates on Smart UAVs** May 2021 - July 2021  
*Research Assistant* Auburn University

- Supported students in UAV technology projects by streamlining logistics, providing mentorship, and addressing machine learning challenges.
- Guided research, offered practical advice, and helped students overcome technical hurdles.
- Enhanced students' understanding and application of machine learning in UAV technology.

**Auburn University** Jan 2019 - Aug 2021  
*Graduate Teaching Assistant* Auburn University

**BooJum Studio** 2017 - 2018  
*Co-founder* Shenzhen, China

We founded a startup studio to streamline the traditional art design process using machine learning and image processing technologies. Our approach quickly generates multiple design options, reducing time and enhancing client choices for a more efficient and innovative design experience.

**Shenzhen Xun Fang Telecom — a Huawei's company** May 2014 - Sep 2014  
*Intern* Shenzhen, China

Maintained and optimized the code of the networking system of the 3G service-provider ([WCDMA](#)) service.

## COMMUNITY SERVICE

---

**K-6 AI club** [[Website](#)] Sep 2022 - Apr 2023  
*volunteer* Auburn University

I volunteered at the K6 AI Club at Auburn University, led by Prof. Anh Nguyen, to inspire elementary school children in mathematics, coding, robotics, and AI. This initiative, supported by Auburn University and an NSF CAREER award, introduced 15-20 kids weekly to AI concepts and applications through coding challenges and robot interactions, fostering an early interest in AI and related technologies.

## PUBLICATIONS

[Google Scholar](#)

---

### NAACL

- [Peijie Chen](#), Thang Pham, Tin Nguyen, Seunghyun Yoon, Trung Bui, Anh Nguyen (2024). PEEB: Part-based bird classifiers with an explainable and editable language bottleneck [[pdf](#) | [Code](#) | [Demo](#)]

### Under Review

- Tin Nguyen, [Peijie Chen](#), Anh Nguyen (2023). Leveraging Habitat Information for Fine-grained Bird Identification [[pdf](#) | [Code](#)]

### Under Review

- Pooyan Rahmazadehgervi, Hung Huy Nguyen, [Peijie Chen](#), Long Mai, Anh Nguyen (2023). Co-Attention Bottleneck: Explainable and Causal Attention Emerged from Transformers Trained to Detect Images Changes [[pdf](#)]

### ACCV (Oral)

- [Peijie Chen](#), Qi Li, Saad Biaz, Trung Bui, A Nguyen (2022). gScoreCAM: What is CLIP looking at? [[pdf](#) | [Code](#) | [Colab demo](#)]

Our proposed method is 10x faster than the SoTA method on visualizing the least multimodal (CLIP), and 5-20% better compared to traditional visualizing methods. With our proposed method, we find that some attacks of the model like *typographic attack* are misinterpreted.

### Under review

- Mehdi Nourelahi, Lars Kotthoff, [Peijie Chen](#), A Nguyen (2022). How explainable are adversarially-robust CNNs? [[pdf](#)]

Conducted a thorough and systematic analysis of 9 feature importance methods on 12 different networks. We find that GradCAM and RISE is the best method among them.

### arXiv

- [P Chen](#), C Agarwal, A Nguyen (2021). The shape and simplicity biases of adversarially robust ImageNet-trained CNNs [[pdf](#) | [code](#)]

We find that a robust network not only has more shape bias, it actually becomes more simply (monotonous) at the neuron level. And this monotonicity not only provides robustness to the model, but also allows it to do better in transfer learning.

### ChinaCom

- L Wang, [P Chen](#), C Wang (2019). Layer-Wise Entropy Analysis and Visualization of Neurons Activation [[pdf](#)]

Though the analysis of entropy in the classifier, we found that we could use entropy to measure the quality of MLP layers in a network. In addition, entropy can be used to predict if the accuracy will drop when we prune the network.

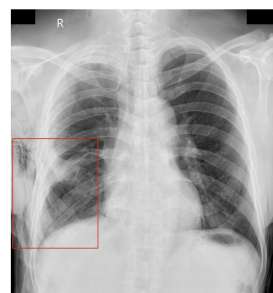
## OTHER PROJECTS

---

### Weakly-supervised medical annotations for chest X-Rays

We developed the first system that explains findings predicted by AI in radiology. Trained on the MIMIC-CXR dataset, our models generate textual reports of x-ray screenings, such as pneumonia or left lower-lobe collapse, without prior explanations. By integrating CLIP and saliency map methods, our system enhances the validation, understanding, and trust in AI-driven radiological assessments.

Bounding box label: Other lesion



#### Retrieval labels and sentences:

##### Cardiomegaly

0.0403 Known large hiatal hernia.

No positive label.

0.0401 This could represent infection or atypical CHF.

##### Cardiomegaly, Edema, Pleural Effusion, Support Devices

0.0399 Previous moderate to severe pulmonary edema has improved substantially since \_\_\_\_33.

No positive label.

0.0397 Mildly prominent pulmonary arteries could relate to a component of pulmonary arterial hypertension.

##### Edema, Atelectasis, Pneumothorax, Pleural Effusion, Support Devices

0.0397 The severity of pulmonary edema has increased in the interval.