

# ABHASH KUMAR SINGH

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## Education

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- University of Wisconsin - Madison  
Master of Science in Computer Science (GPA: 3.95/4.0) Madison, WI  
Sep 2019 – Dec 2020
- Birla Institute of Technology and Science  
Bachelor of Engineering in Computer Science (GPA: 8.31/10.0) Pilani, India  
Aug 2010 – Jul 2014

## Technical Skills

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- Programming languages: Java, Python, Swift, MATLAB
- Libraries/SDKs: NumPy, scikit-learn, pandas, PyTorch, Keras, TensorFlow, Matplotlib, Android SDK, iOS SDK

## Projects

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- Data Augmentation for Languages with small datasets [\[GitHub\]](#)
  - Applied data augmentation techniques to improve Machine Translation for Hindi language using XLM model
  - Achieved ~4.5% increase in average BLEU score with Random Swap method
- Activity Detection in Cholecystectomy Videos [\[Website\]](#) [\[GitHub\]](#)
  - Implemented a CNN-GRU model for tool recognition and phase detection tasks in gall bladder surgery videos
  - Improved classification accuracy by ~6% for tool recognition with Resnet-152 model
- Layer Freezing for Data Parallel Fine Tuning [\[GitHub\]](#)
  - Investigated layer freezing (avoiding gradient computation) to improve distributed data parallel fine-tuning
  - Achieved ~65% reduction in total training time with a tradeoff of ~8% dip in test accuracy using Resnet-18 model on CIFAR-10 dataset

## Work Experience

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- Amazon Web Services  
Software Development Engineer - AWS Amplify for iOS and Android  
Feb 2021 - Present  
Seattle, WA
  - Improved DataStore local query performance for model schemas with secondary indexes by ~25% [\[GitHub\]](#)
  - Delivered custom domain name support for GraphQL endpoints in API category [\[GitHub\]](#)
  - Implemented custom endpoints support for Cognito User Identity Pool in Auth category [\[GitHub\]](#)
- University of Wisconsin - Madison  
Grader - Artificial Intelligence (CS540)  
Spring 2020, Fall 2020  
Madison, WI
  - Graded assignments and helped students on topics like k-NN algorithm, A\* search, Hill Climbing, Naive Bayes classification, PCA, Minimax algorithm, Hierarchical clustering, Linear Regression and CNN
- Amazon Web Services  
Software Development Engineer Intern  
May 2020 - Aug 2020  
Seattle, WA
  - Implemented Developer Menu in AWS Amplify iOS library for filing customer issues [\[GitHub\]](#)
- TiVo  
Engineer, Software Development  
Aug 2017 - Jul 2019  
Bangalore, India
  - Reduced memory usage of the TiVo Android app by ~20% through efficient use of bitmaps
  - Implemented streaming events logging functionality in Haxe for mobile and DVR platforms
- Samsung Research Institute  
Senior Software Engineer  
Aug 2014 - Jul 2017  
Bangalore, India
  - Developed and designed Notifications feature in Car Mode Android app end to end
  - Added text to speech read-outs functionality for notifications (Calls, Messages, Alarm, Traffic Alerts)

## Patents and Publications

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- Systems and Methods for Content Preference Determination based on Swipe Analysis [\[Link\]](#)
- Smart tagging of user feelings while consuming media content [\[Link\]](#)
- Learning a new language while consuming media content [\[Link\]](#)