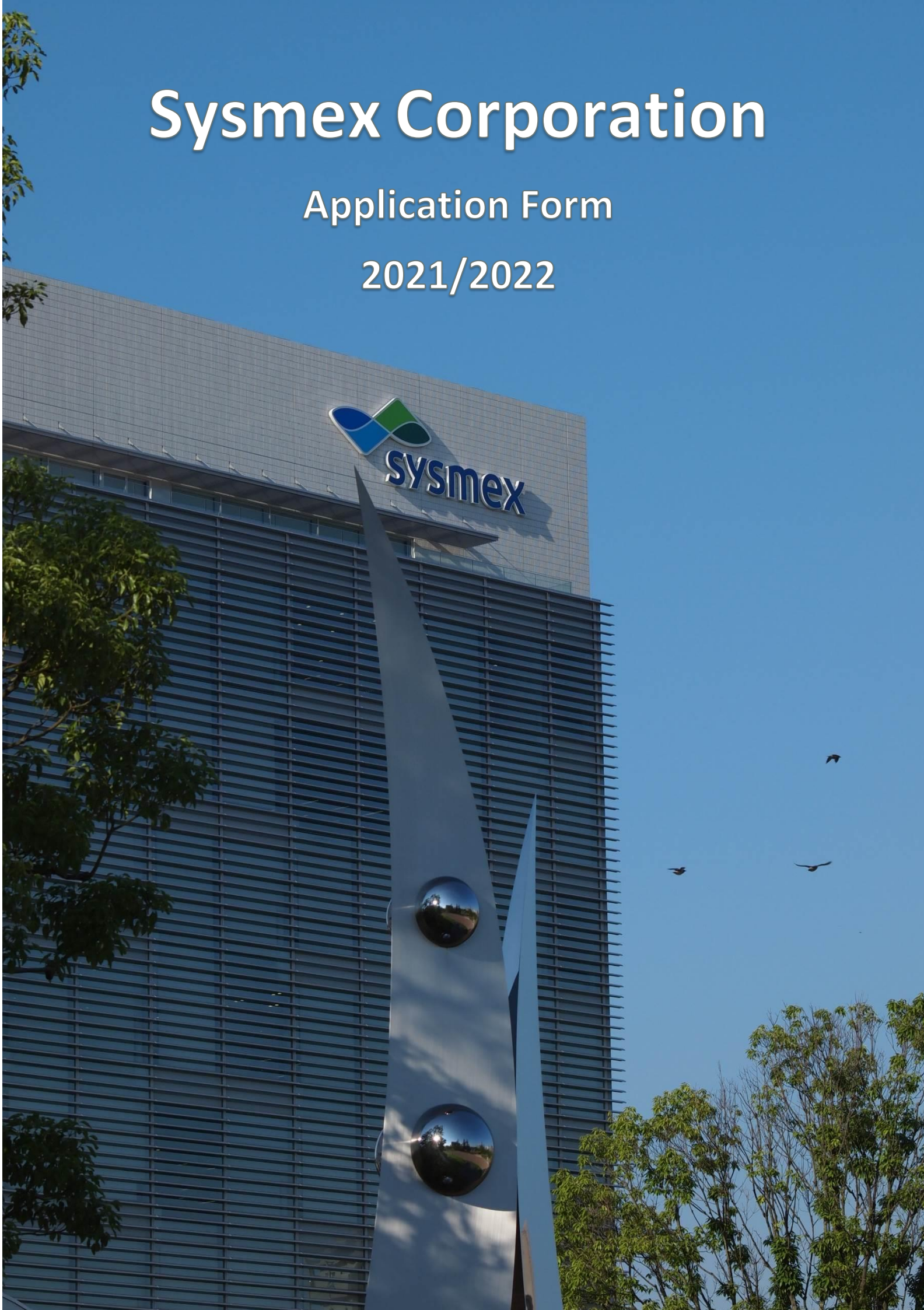
Sysmex Corporation

Application Form

2021/2022



Sysmex Corporation Application Form

Sysmex Corporation: Application Overview

Thank you for your interest in joining Sysmex Corporation. To complete your application, please fill in your details in the spaces provided below and explain why you are interested in joining us as a permanent employee from October 1st, 2022.

Candidate Information:

Name:	**Abhishek Narayan Chaudhury**
University:	**Indian Institute of Technology, Bombay**
Major:	**Industrial Engineering and Operations Research**

Motivation:

Please tell us in the space below why you wish to join Sysmex Corporation.

I am interested in the role 'Computer Scientist & Engineering Associate' advertised by your company. During my graduate study, I worked on several different image analysis projects, including medical image analysis, which has prepared me for a potential role in an industry similar to that I am applying. For example, in one of my machine learning projects, I teamed up with a diverse group of my colleagues to implement an automated deep learning method for Covid-19 detection using pre-processed 2-D CT scan images. As a sub-task, to segment the lung images from the recorded data, we trained a deep neural network to segment out lungs with a considerable amount of accuracy. And use it for predicting chances of Covid infection of a patient (based on the DenseNet model). It will help as a low-cost covid detection method and help reduce the strength of rays used during the CT scans. I am currently working with my colleagues to implement a diffusion-based technique for depth estimation and image restoration from defocused images. Image restoration is an important problem for blurred CT scans that can happen due to patients' autonomous or involuntary movements, and we can use such technology to improve it. This project has exposed me to the current cutting-edge machine learning research being applied to medical imaging and has inspired me to work more in this direction.

Sysmex Corporation is among the top 10 global IVD companies with magnificent work culture & full of talented people that I think will help me learn a lot and apply my knowledge to solve different problems. I also enjoy working with people as it brings out different perspectives and approaches to the task. In my opinion, meeting people from diverse backgrounds gives one exposure and altogether a unique experience. Working in a Japanese company will cater to my requirements at a principle level. Since Japan also happens to be a technological superpower, my takeaway from this employment will be great.

Suitability:

Please tell us why you think you are a suitable candidate, and how your experience and skills would be of benefit to the company.

During my graduate study at IIT Bombay, I have taken several classes and worked on several projects involving Machine Learning, Deep Learning, and Digital Image Processing. Some representative courses and projects are described below.

In the Deep Learning domain, I have taken courses where I have learned about different Deep Learning and Machine Learning models and the right way. In Deep Learning Course, I came across different Convolutional networks and worked on a project in that course on how to use pruning to find a subnetwork that trains faster but gives a commensurate accuracy. In the course, I also got an introductory idea on more stat of the art neural networks like Recurrent Neural Network and Generative Adversarial Network.

In Image processing, I am currently taking a class on Digital Image Processing where I came across statistical and mathematical methods underlying different image processing algorithms on image enhancement, noise removal, segmentation, edge detection, corner detection, and doing a project where we are trying to implement an image restoration technique which can help in analysing defocused images.

In the Machine Learning domain, I have taken a class on Statistical Machine Learning and Data Mining where I learned about mathematical underpinnings of different Machine Learning models, and with a diverse group of students, I tried to implement a Deep Learning based Image Analysis model to detect covid in the CT scan images of lungs.

Additionally, in my MSc project, I learned about using Recurrent Neural networks and LSTM (Long Short-Term Memory) to solve demand forecasting in high-dimensional data settings.

Career Goals:

Please tell us about your career aspirations, and what you would like to achieve with Sysmex Corporation - should your application be successful.

After earning an undergraduate degree in math, I decided to pursue a graduate degree in IEOR. I wanted to apply the mathematics that I learned to solve real-world problems. To achieve this, at IIT B, I have taken industry-oriented courses. I could learn to develop and use concepts from mathematics and computing to real-world problems, including but not limited to applying deep learning techniques in medical imaging and optimize models to train faster through pruning.

I am very much interested in the mathematics of machine learning and interested in applying efficient Deep Learning models in Image processing and other real-world problems. As I come from a pure math background, I can quickly grasp the mathematical concepts underlying things. Therefore, apart from being an end-user of deep learning algorithms, I am also interested in the mathematical details of the problems like robustness and computational efficiency. Also, I have a keen interest in the theoretical backgrounds of different algorithms and developed my interest in statistical and mathematical methods underlying different image processing algorithms such as image enhancement, noise removal, segmentation, edge detection, corner detection.

I want to use my mathematical and statistical knowledge to learn more about machine learning, deep learning, image processing to study and use more efficient, less time-consuming algorithms for different works in solving real-world projects undertaken by the corporation. I believe Sysmex, through this position, is offering a possibility for me to continue the path of using my mathematical and computing skills to solve real-world problems.