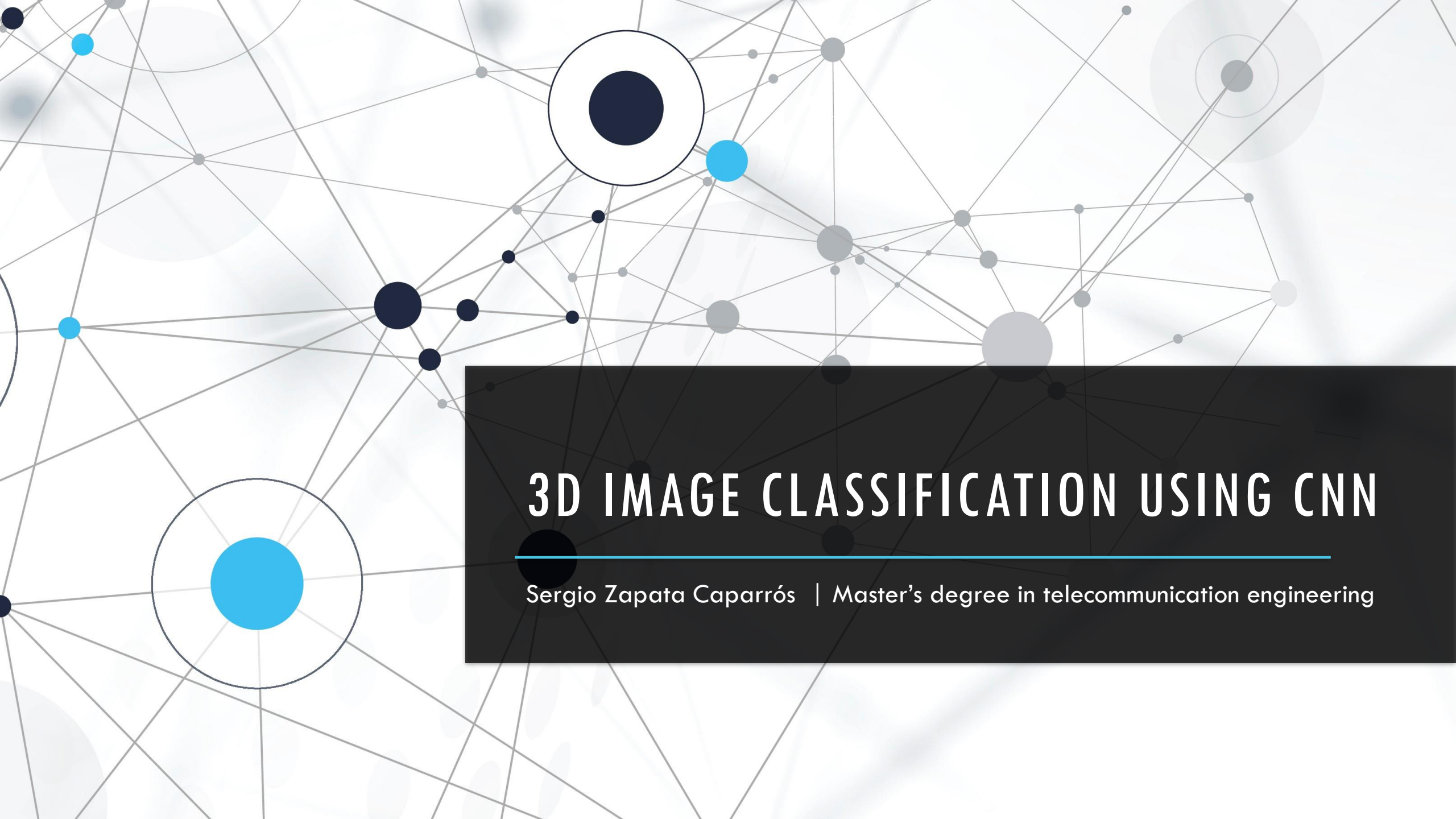
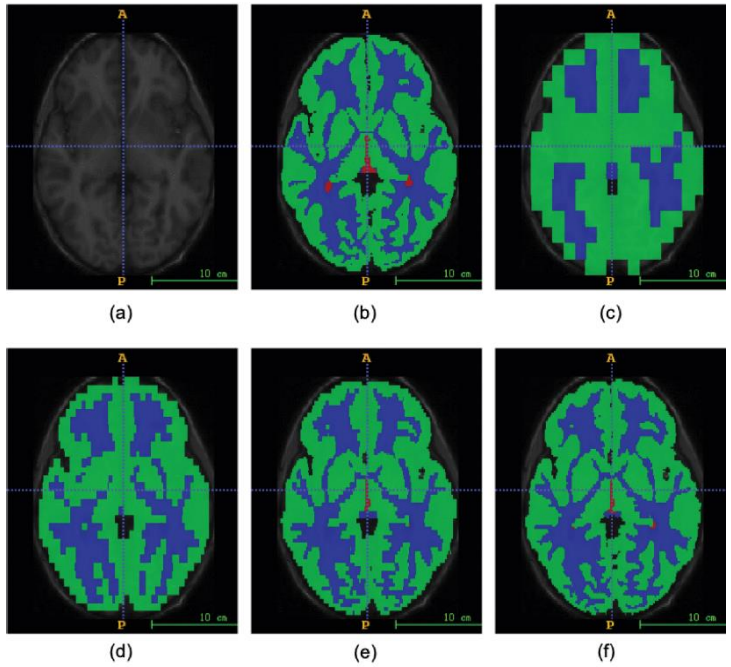


3D IMAGE CLASSIFICATION USING CNN

Sergio Zapata Caparrós | Master's degree in telecommunication engineering

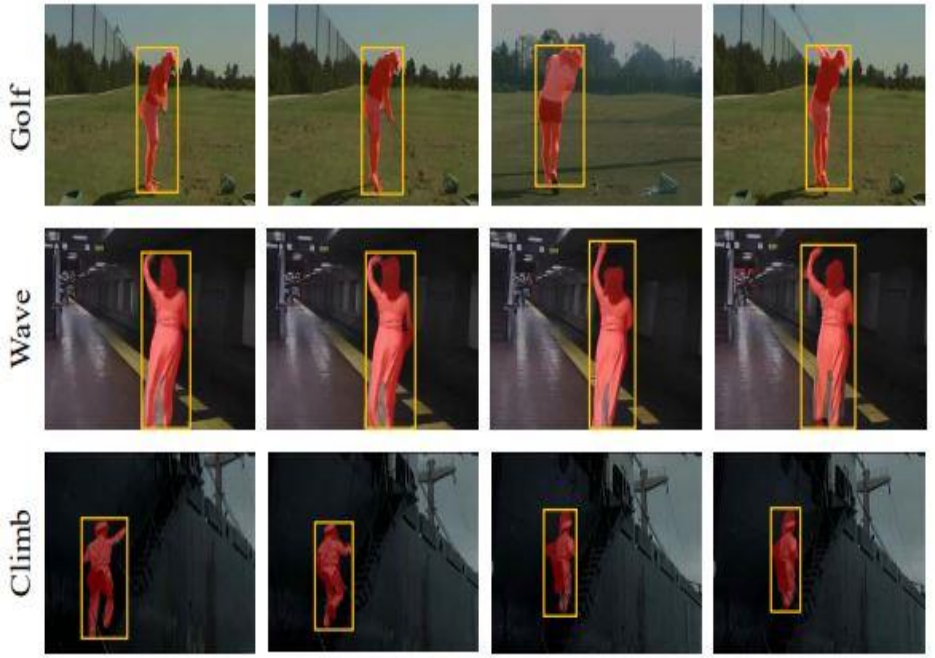
3D CNN APPLICATIONS

Medical images



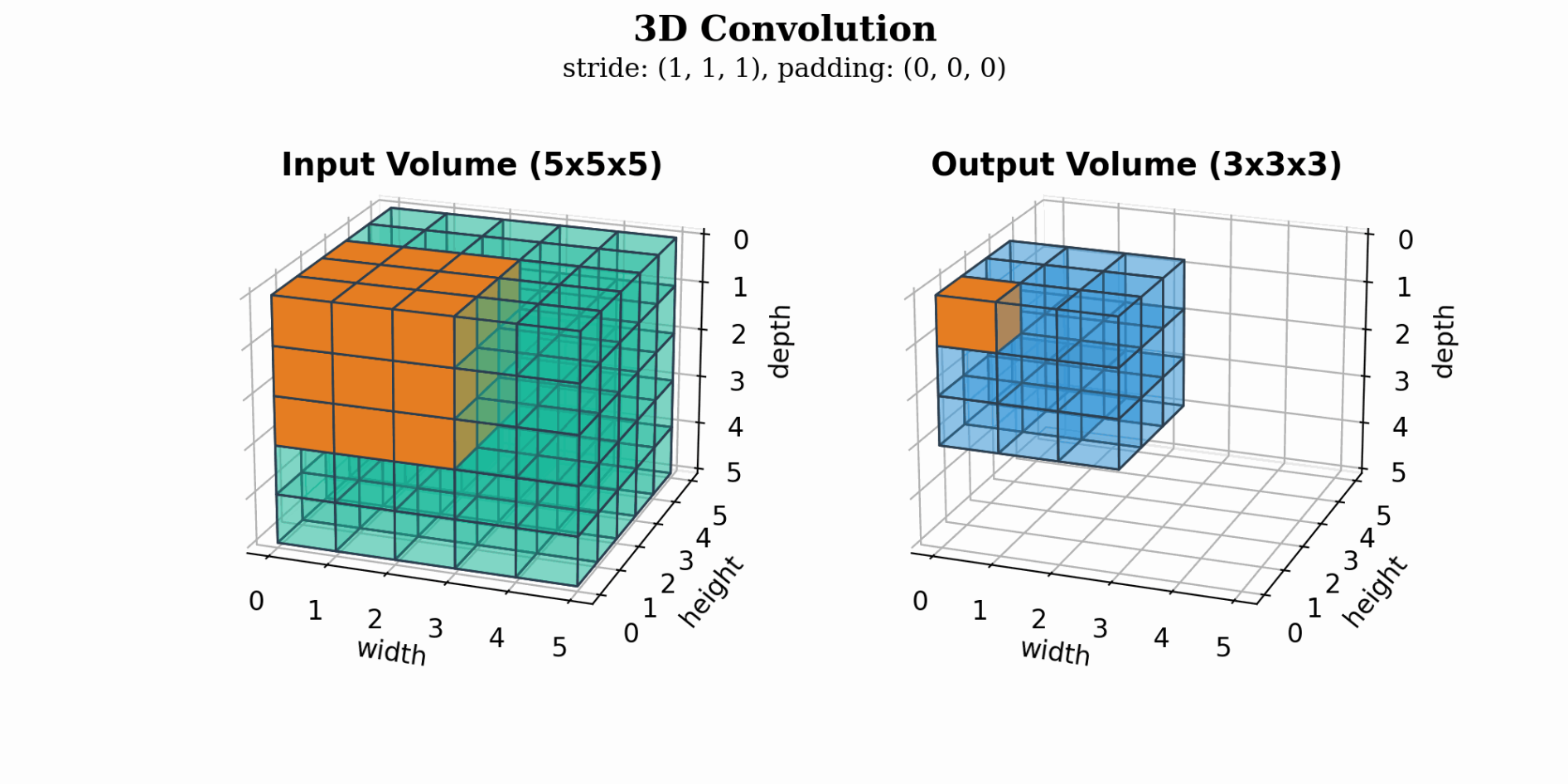
Fuente: L. Wang, C. Xie, and N. Zeng, "Rp-net: A 3d convolutional neural network for brain segmentation from magnetic resonance imaging,"

Video processing



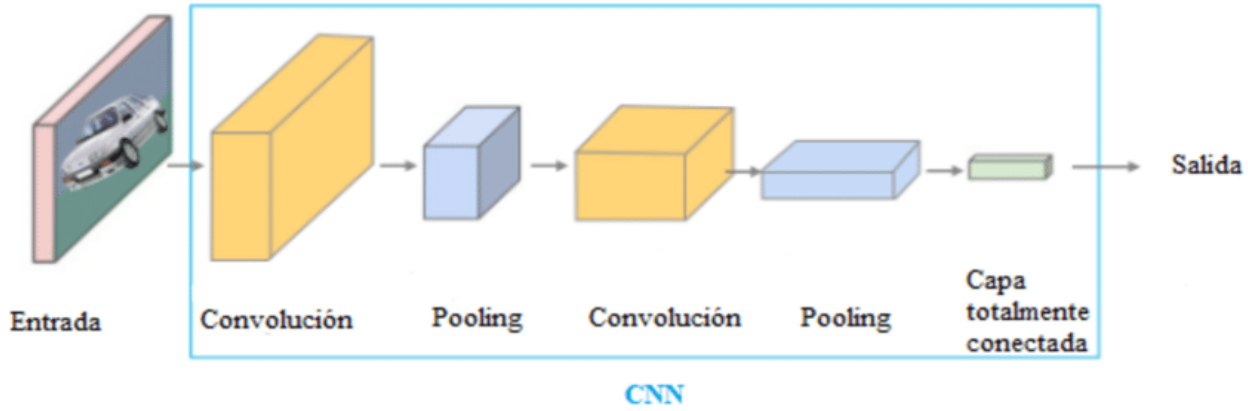
Fuente: R. Hou, C. Chen, R. Sukthankar, and M. Shah, "An efficient 3d cnn for action/object segmenta- tion in video,"

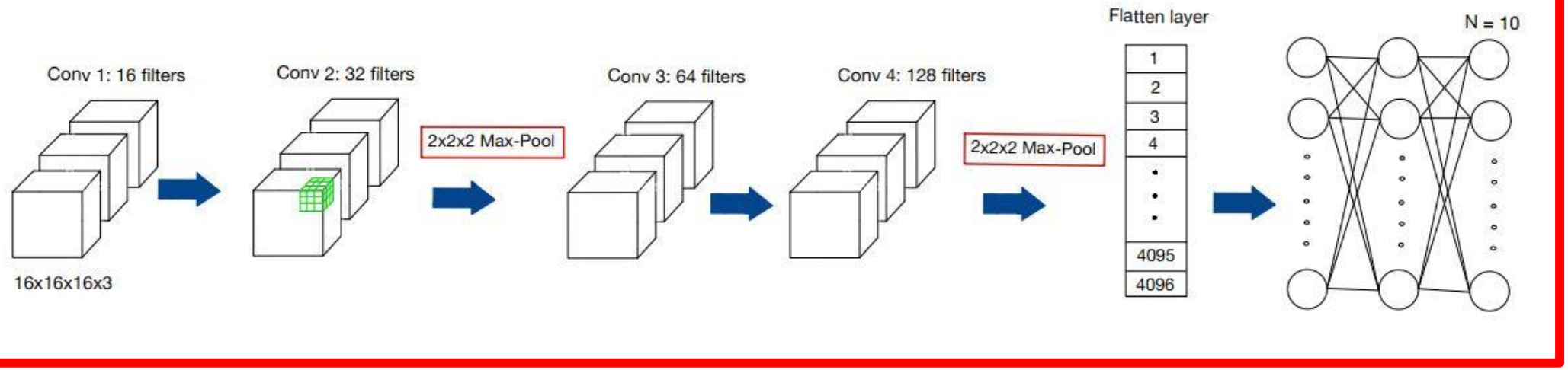
3D CONVOLUTION



MODEL ARCHITECTURE

General layout

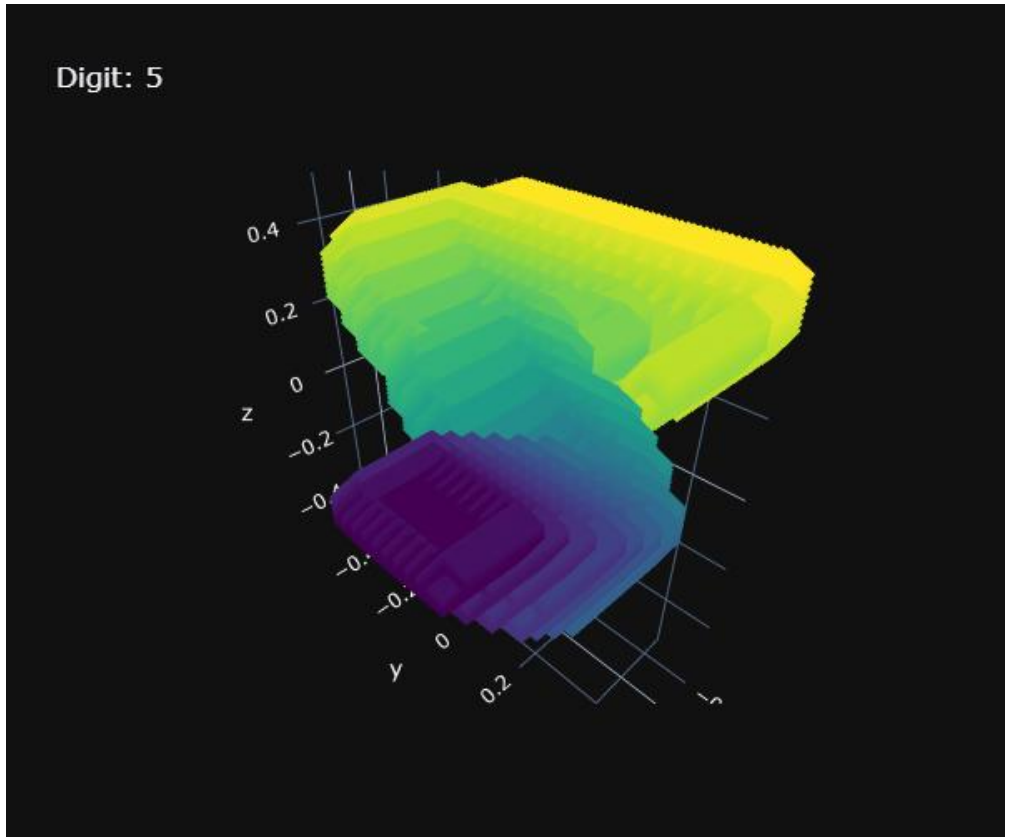


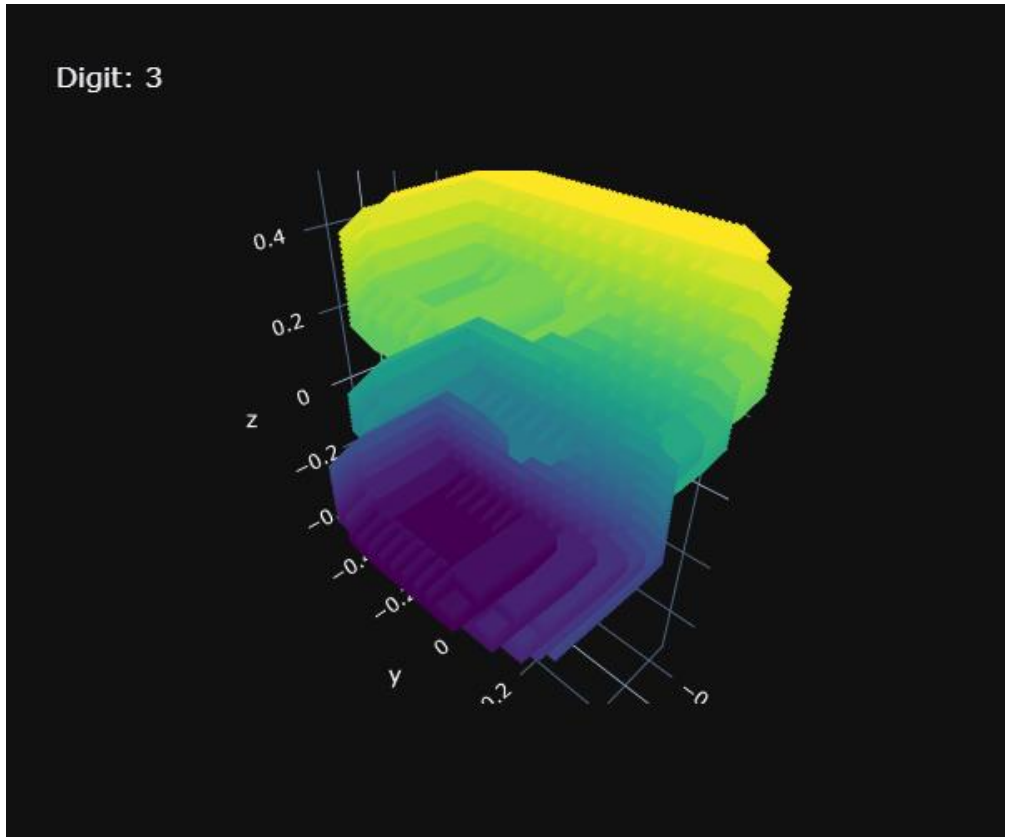


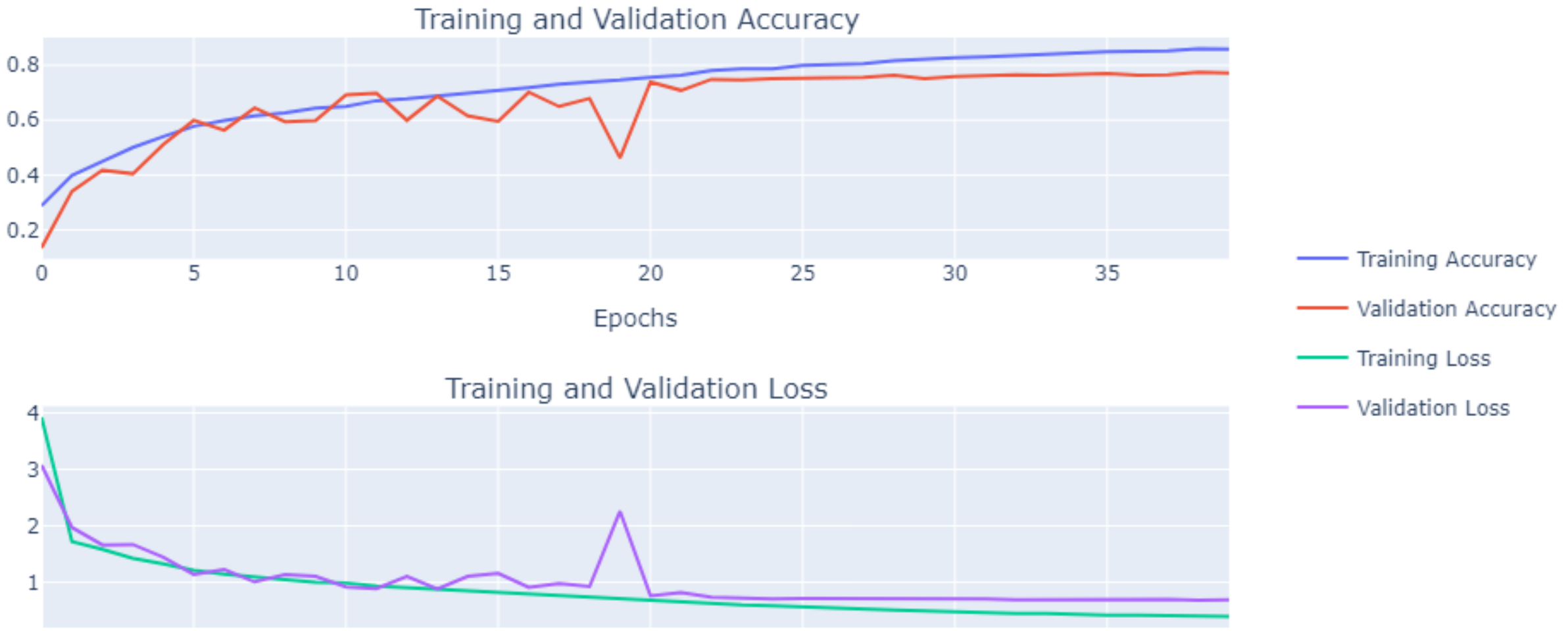
MODEL VALIDATION

- Validation curves
- Confusion Matrix

DATASET DESCRIPTION

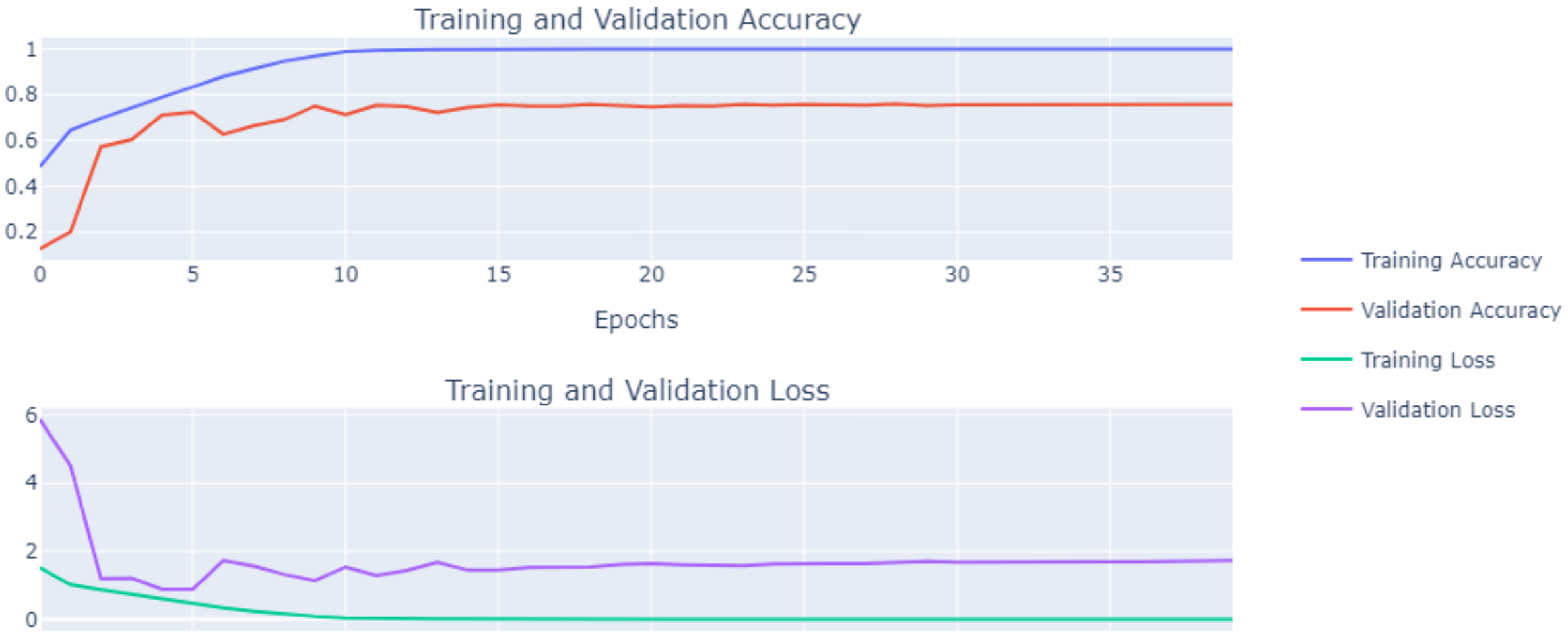






VALIDATION CURVES OF THE MODEL

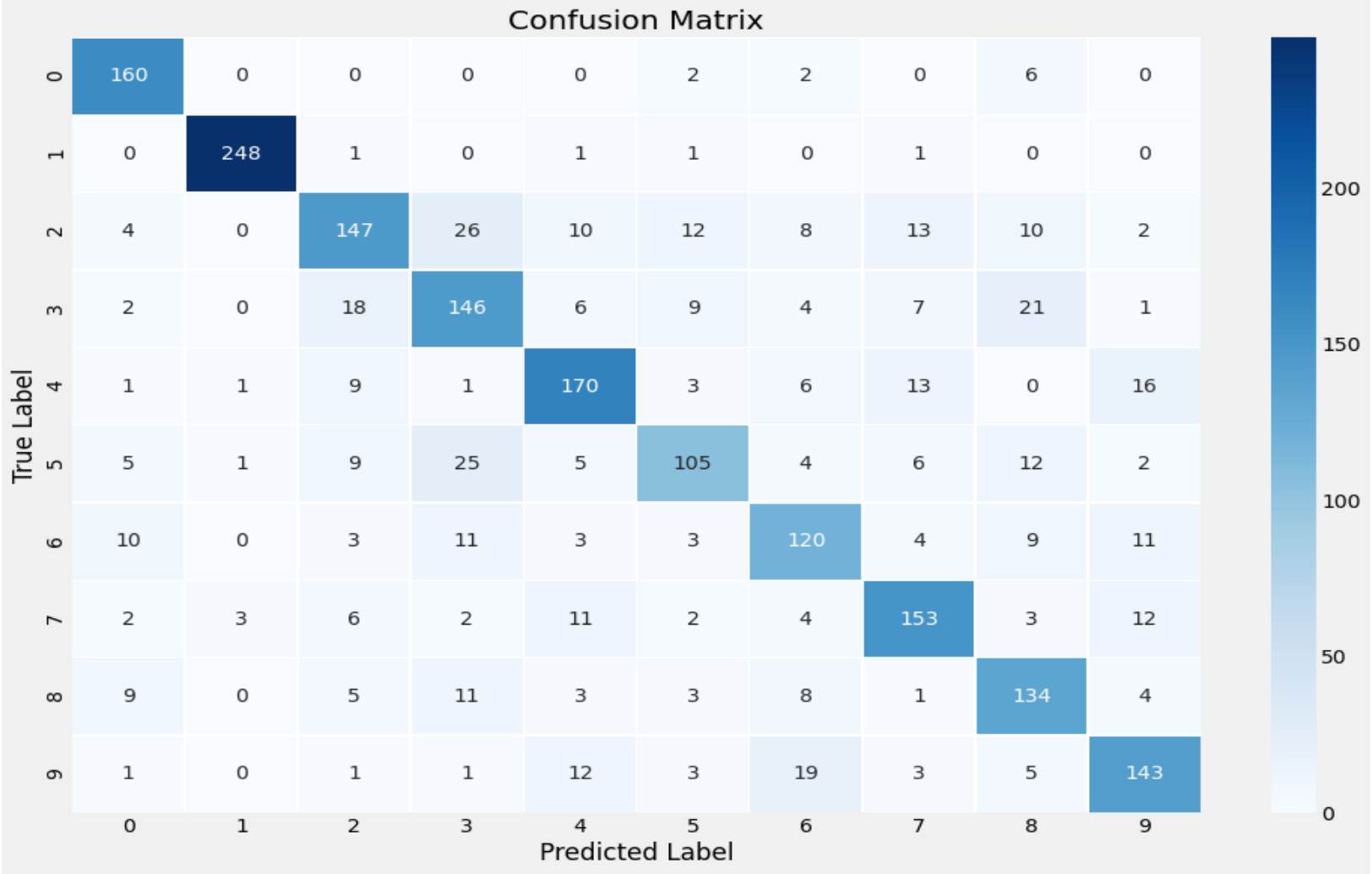
	Validación	Entrenamiento
Accuracy	0.771	0.858
Loss	0.690	0.396



VALIDATION CURVES OF THE MODEL

Overfitting!!

CONFUSION MATRIX



REFERENCES

[1] D. de la Iglesia Castro, “3D MNIST,” Oct. 2019.

[2] A. I. Bootcamp, “Intro a las redes neuronales convolucionales - bootcamp ai,” *Medium*, Nov 2019.
[Online].

[3] H. Andrade, “Modelo para detectar el uso correcto de mascarillas en tiempo real utilizando redes
neuronales convolucionales,” 2021. [Online].

[4] W. Alakwaa, M. Nassef, and A. Badr, “Lung cancer detection and classification with 3d convolutional neural network (3d-cnn),” [Accessed: 16-Jan-2024].

[5] L. Wang, C. Xie, and N. Zeng, “Rp-net: A 3d convolutional neural network for brain segmentation
from magnetic resonance imaging,” *IEEE Access*, vol. 7, pp. 39670–39679, 2019.

[6] R. Hou, C. Chen, R. Sukthankar, and M. Shah, “An efficient 3d cnn for action/object segmentation in video,” 2019.

[7] TensorFlow, “Video classification with a 3d convolutional neural network.” https://www.
tensorflow.org/tutorials/video/video_classification. [Online].

[8] “When should i use 3d convolutions?.” https://ai.stackexchange.com/questions/13692/
when-should-i-use-3d-convolutions. [Online].

[9] “Plotly.” https://plotly.com/python/plotly-express/. [Online].

[10] Mattop, “3d mnist digits tensorflow cnn.” https://www.kaggle.com/code/mattop/
3d-mnist-digits-0-9-tensorflow-cnn/log, 2022. [Online; accessed 16-Jan-2024].

[11] “The sequential class.” https://keras.io/api/models/sequential/. Accessed: 2024-1-16.

[12] Keras, “Adam.” https://keras.io/api/optimizers/adam/. [Online; accessed 19-Jan-2024]