MAXIME BURCHI

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EDUCATION

ESIEE Paris, Université Gustave Eiffel — September 2018 - July 2021
Master of Engineering in Computer Science — Noisy-le-Grand, France
Machine Learning and Embedded Systems

ESIEE Paris, Université Gustave Eiffel — September 2016 - June 2018
Classes Préparatoires, Scientific Preparatory Classes — Noisy-le-Grand, France
Mathematics, Physics, Electrical Engineering and Computer Science

Lycée Dorian — September 2012 - June 2015
Baccalauréat Scientifique, Scientific High School Diploma — Paris, France

WORK EXPERIENCE

Research Intern, Automatic Speech Recognition (ASR) — February 2021 - July 2021
Orange Labs, *Advised by Valentin Vielzeuf* — Rennes, France

- Performed research to reduce end-to-end learning methods complexity in the area of ASR.
- Implemented, trained and evaluated state-of-the-art architectures from scratch using PyTorch.
- Developed an efficient architecture design inspired from previous works done in ASR and vision.
- Proposed a novel attention mechanism to reduce attention complexity without hurting performance.

Software Engineering Intern — July 2018 - October 2018
Vision-IT — Paris, France

- Vizion-IT is a cloud computing service provider for small companies.
- Joined software development team to develop and maintain company website with JEE technology.

PUBLICATIONS

Maxime Burchi, Valentin Vielzeuf. Efficient Conformer: Progressive Downsampling and Grouped Attention for Automatic Speech Recognition. ASRU 2021, Cartagena, Colombia.

PROJECTS

TensorCloud

TensorCloud is a set of neural APIs accessible over HTTPS or via a website interface. Requests are first authorized by a main server before being processed and answered by APIs in parallel. It includes:

- A Natural Language Generation API using a pretrained GPT-2 model.
- Speech Recognition and Text-To-Speech APIs based on sequence-to-sequence transformer models.
- An Object Detection API using a pretrained Mask R-CNN.

Developed and trained Automatic Speech Recognition model on the LibriSpeech dataset.
Implemented and trained Text-To-Speech model on the LJSpeech dataset.
Ref: *Li et al., Neural Speech Synthesis with Transformer Network*
Deployed project website, server, APIs and SQL database containers on Google Cloud Platform.
See Natural Language Generation API demonstration here

MALIS, Medical Image Segmentation and Object Detection
Advised by Laurent Najman

- Implementation of an instance segmentation method applied to medical images.
  Volume segmentation using a 3D U-Net trained on the Cremi dataset.
- Implemented and trained a Faster R-CNN on the COCO dataset to perform object detection.

Mechanical automation of two music instruments: Pan Flute and Xylophone

- Created a mechanical orchestra controlled by microcontroller units connected to an iOS app.
- Designed and built xylophone playing machine and prototypes.
- Developed real time embedded C code on TI MCUs and electrical circuit to control motors.
  See xylophone playing demonstration here

20-bit RISC processor implemented in VHDL on FPGA

- Developed simple instruction set architecture based on RISC principles.
- Simulated processor and RAM on FPGA to run programs compiled into our machine code.

AWARDS

The ESIEE Paris JDP (Journée des Projets) is an annual project competition where groups of students are invited to present their work to a jury.

- 2019 ESIEE Paris JDP Award by Texas Instruments, Mechanical Orchestra
  Award attributed to the most technical project using Texas Instruments components.

SKILLS

Software	C/C++, Python, PyTorch, TensorFlow, Java, Shell script, Git, Docker, SQL
Languages	French (native), English (fluent), Chinese (elementary)