Stevenage, Hertfordshire, United Kingdom
timothynewman.co.uk

# Timothy J Newman

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## Employment

**RF/Analog IC Engineer** — **Ensilica, Oxfordshire, United Kingdom** — **Sep 2024 – Present**

- Designed analog blocks for RFICs including LVDS clock receiver, bandgap references, temperature sensor and baseband buffer
- Taped out ICs in leading process nodes including finfet and SOI using leading EDA tools and techniques
- Verified designs to ensure both signal chain performance and functional performance through mixed-signal co-simulations
- Validated an RF beam-former IC by creating automated tests based on an internal test platform and presented reports to clients

**RF Design Verification Intern** — **Mediatek, Kent, United Kingdom** — **Apr 2023 – Sep 2023**

- Worked on an intermediate frequency chip designed for a 5G mobile communication platform
- Modelled circuit behaviour with Verilog-AMS, ran cosimulations & transistor level simulations and analysed results with scripts
- Took responsibility for chip power estimation and current measurement final test sequences for post-silicon testing
- Presented results in daily verification meetings and coordinated with multiple RFIC designers

**Front-end Developer Intern** — **Bühler UK, London, United Kingdom** — **Jul 2022 – Sep 2022**

- Developed desktop GUI using ElectronJS, ReactJS and TailwindUI for querying an internal data management platform
- Setup CI/CD pipeline on Azure DevOps with test, build and publish stages to distribute application for user testing
- Presented applications to both technical and non-technical users to gain feedback which was then incorporated into later versions

**Undergraduate Teaching Assistant** — **Imperial College London**

- In 2021-2022, conducted one-to-one help sessions for students taking the Topics in Electrical Engineering module
- In 2022-2023, assisted in software defined radio lab in the Communications module

## Education

**Imperial College London** — **United Kingdom** — **Oct 2020 – Jun 2024**

- **MEng in Electrical and Electronic Engineering** 75.34% (First class honours)
- **Thesis**: Investigating chopper stabilisation in reducing flicker noise in Ion-Selective Field Effect Transistors (ISFET)
  - Created python code to interface with test equipment to prove concept using an existing chip
  - Fabricating a test chip on TSMC 65nm silicon in February to integrate readout electronics on silicon with the sensor
  - Designed ISFET using metal planes as floating gates and optimised dimensions to minimise capacitive attenuation of signal
  - Designed switched capacitor programmable gain amplifier for sensor reading out with emphasis on low noise
  - SPI and digital clock generator synthesised, placed and routed using Cadence Genus and Innovus
- **Relevant Modules:** Analog Integrated Circuits, Digital Systems Design, Digital Signal Processing, Instrumentation, Electromagnetics, Digital Electronics and Computer Architecture, Machine Learning, Power Electronics, Optoelectronics, Full-Custom Integrated Circuits, Sensors, Hardware and Software Verification, Digital Image Processing, Computer Vision and Pattern Recognition and Radio-Frequency Subsystems

**Anglo Chinese School (Independent)** — **Singapore** — **Feb 2017 – Nov 2019**

- International Bacclaureate Diploma Program, 41/45 points overall, HL Math 7, HL Physics 7, HL Chemistry 7

## Languages and Technologies

- **Programming:** Python, Javascript, C++, Matlab, Verilog, SQL, TCL, Dafny, Isabelle
- **Tools:** Quartus, LTSpice, KICAD, LabView, Simulink, Git, IBM Cloud, Fusion 360, Azure DevOps, STM32CubeIde, Cadence Virtuoso, Cadence Genus & Innovus, Cliosoft SOS, Calibre, Ansys HFSS, Cadence Microwave Office, Red Hat Linux

## Technical Experience

**2024**

- **RF Repeater** Designed a RF repeater in Cadence Microwave Office. Considered, the gain, noise figure and IP3 and designed impedance matching networks and filters.
- **Depth Estimation Using Stereovision** Used the Matlab computer vision toolbox to estimate camera parameters and parallax angle between image frames to find distance.
- **ISFET characterisation** Created an automatic testing framework for characterising an ISFET chip in a new technology node. Created pH buffers, electroplated silver electrodes and assembled a 3D printed microfluidic manifold for testing pH sensitivity.

**2023**

- **Inductive Distance Sensor** Designed an inductive distance sensor using a PCB stretched coil and inductance measurement sensor. First simulated the coil in Ansys HFSS and after fabrication, characterised the coil impedance using a VNA, then calibrated the sensor using linear interpolation of measured values.

- **Design of DAC** Designed and laid out a 12-bit R-2R DAC in GPDK45 for the full-custom integrated circuits module.
- **Formal Verification** Completed hardware and software formal verification tasks using Dafny, Isabelle and Symbiyosys.
- **Impedance measurement meter** Designed and built PCB with auto-balancing bridge to measure impedance. Programmed a STM32 microcontroller to generate sinewaves up to 100kHz and implemented Geortzel algorithm to process measured voltages.
- **Function accelerator using FPGA (Altera DE1)** Implemented a hardware block in verilog using the Cordic algorithm to calculate an equation. The block was then invoked in the NIOS2 processor using a custom instruction.

**2022**

- **Autonomous Mars Rover (Top 2nd year group project)** Worked in a 7 member group to create a 2-wheel rover designed to autonomously navigate through a simulated Martian surface with obstacles. I contributed towards the drive subsystem by interfacing an optical flow sensor with the ESP32 and tuned an algorithm for precise rotation and linear motion. I also created an analog readout circuit for the doppler radar module.

**2021**

- **Analogue Music Synthesizer (Top 1st year group project in category)** Designed and simulated a 88-key analog music synthesizer in LTSpice. Considered the product design specifications, costs, power consumption and waveform quality. Created a Python program to transcribe frequencies from a CSV file to piece-wise voltage level directives in LTSpice for testing.
- **Personal Website** Created website with GatsbyJS for the front-end and Strapi.io for the content management system (CMS). Optimized layout and images for different screen sizes and setup continuous deployment for static content on Netlify from Github repository. Configured Linux VPS, Postgres database and Nginx server to host CMS.
- **Optiver TraderCraft 2021 (2nd placed team)** Created a Python delta hedging trading algorithm and competed with other teams to make highest profit. I was selected to attend the Insights Days program.

**2019**

- **European Organization for Nuclear Research (CERN)** Selected among 30 students for a weeklong study trip. Attended lectures on topics including particle physics, computing and medical applications. Visited data centre, CMS detector and anti-matter factory.
- **Singapore Astronomy Olympiad 2019** Silver medalist and best star-gazer in olympiad focussed on astronomy and astrophysics

## Publications

- IEEE R8 Student Paper Contest 2024 7th place; Submission title: **Reusable high-power rocketry with atmospheric data collection**, co-authored with Václav Pavlíček and Awais Khawaja
- IEEE Solid-State Circuits Society "Code-a-Chip" Travel Grant Award 2025; Submission title: **Open-Source Implementation of IEEE P2427 Defect Coverage Standard**, co-authored with Fion Feng Shen Foo, Woodie Weizheng Wang and Ashcharya Kela.

## Activites and Interests

- Violinist at IC Sinfonietta Orchestra and pianist with ABRSM grade 7 Piano
- **President of IC AstroSoc** I collaborated with my committee to organise stargazings, lectures and trips and to maintain our telescopes. Increased membership by 10% and organised new trips to South Downs and Silwood Park.
- **IC Space Society** Constructed a high-power rocket to participate in the National Rocketry Championship. As part of the electronics team, I designed a PCB flight computer to record and transmit sensor values using a 915MHz LoRa radio.