Professor Ravi Silva

500+ connections

Director, Advanced Technology Institute, University of Surrey, Engineering & Research

Guildford, United Kingdom | Higher Education

Current	University of Surrey, SLINTEC - Sri Lanka Institute of Nanotechnology
Previous	Surrey NanoSystems Ltd, Department of Engineering at the University of Cambridge
Education	University of Cambridge
Recommendations	**1** person has recommended **Professor Ravi**
Websites	Portfolio Company Website

Experience

Professor/ Director of Advanced Technology Institute

University of Surrey

April 2003 – Present (12 years 5 months)

Ravi Silva is the Director of the Advanced Technology Institute (ATI) and heads the Nano-Electronics Centre (NEC), which is an interdisciplinary research activity. The NEC has over 50 research staff. He joined Surrey in 1995.
Ravi studied at the Eng. Dept. at Cambridge Univ. for his undergraduate and postgraduate work. His research has resulted in over 500 presentations at international conferences, and over 500 journal papers. He is the inventor of 25 patents.
Ravi is the external examiner for the University of Cambridge Engineering Tripos. He is an external examiner for Universities in the Uk and also abroad.
In 2003 the largest EPSRC Portfolio award for £6.68M was made to Prof. Silva and his team on Integrated Electronics, which was followed in 2004 by a SRIF award for £4M to set up a Nano-Electronics Centre for multidisciplinary research. In 2005, the Nano-Electronics Centre was a finalist in the Emerging Technologies category of the IEE 2005 Awards for Innovation in Engineering.
Prof. Silva was on the advisory board of Imprimatur Ltd and the National Nanotechnology Initiative (NNI) of Sri Lanka. He spent the year 2008 acting as an Advisor to the Honourable Minister of Science and Technology in Sri Lanka, and was intrumental in setting up the Sri Lanka Institute of NanoTechnology (SLINTec) and the Nano-Science Park NANCO (private) Ltd. He acts as an advisor to both these activities and sits on the director board. Prof. Silva was also a member of the Electrical and Electronic Panel (UoA24) for the Research Assessment Exercise (2003-2008) RAE2008, EPSRC Nanotechnology Task Force and sat (2007-2010) on the Engineering and Physical Sciences Research Council's (EPSRC) Technology Opportunities Panel (TOP). Since

2005 he has worked with the National Science Foundation (NSF), Sri Lanka to establish nanotechnology as a vehicle from which to create wealth for the nation that will allow for poverty alleviation in the country.

Director
SLINTEC - Sri Lanka Institute of Nanotechnology
2006 – Present (9 years)

Professor of Solid State Electronics
University of Surrey
2002 – Present (13 years)

Teaching and Research in Nanotechnology Applications

Reader/Lecturer
Head of NanoElectronics Centre, University of Surrey
1999 – Present (16 years)

Teaching and Research Nano-Electronics. University Admissions□student recruitment for 4 years

Director
Surrey NanoSystems Ltd
2006 – 2015 (9 years)

Board Director

Research Associate
Department of Engineering at the University of Cambridge
1994 – 1995 (1 year)

Solid State Electronics Research

Projects

Application of Nanotechnology in the Energy Business
February 2010 – March 2011

Team members□Professor Ravi Silva, Shengwei Shi

SENSATION
January 2004 – April 2008

SENSATION aimed to explore a wide range of micro and nano sensor technologies, with the aim to achieve unobtrusive, cost-effective, real-time monitoring, detection and prediction of human physiological state in relation to wakefulness, fatigue and stress anytime, everywhere and for

everybody, in order to prevent relevant accidents and thus promote the health, safety and □uality of life of people.

Team members□Professor Ravi Silva, Stella Nikolaou, Evangelos Bekiaris, Miguel Gon□ale□-Mendo□a, Bj□rn Peters, DAMIANI Sergio, Anna Anund, Adrian Pearce, Stephen Dunne, Giulio Ruffini, Thomas Pen□el, Carlo Cacciabue, Nicos Maglaveras, Ioanna Chouvarda, Joseph Micallef, Serge Boverie, Rodolfo Ibarra Oro□co, Torbjorn Akerstedt, Juha Kortelainen, Martin Frit□sche

Volunteer Experience & Causes

Causes Professor Ravi cares about:

Economic Empowerment
Education
Environment
Poverty Alleviation
Science and Technology

Honors & Awards

JJ Thomson Medal
Institute of Engineering & Technology
November 2014

The J J Thomson Medal for Electronics was awarded to Professor S Ravi P Silva BA MA PhD CEng CPhys FIET FInstP FREng Director, Advanced Technology Institute, Professor of Solid State Electronics and Director, Nano-Electronics Centre, University of Surrey for an outstanding contributions to the development of electronic materials and specifically, carbon electronics.

Distinguished Visiting Professor
Chonbuk National University, South Korea
May 2014

Royal Society Clifford Patterson Award
Royal Society
2011

The Clifford Patterson Pri□e lecture is for outstanding contribution in the fields of Carbon Nanoscience and Nanotechnology.

Royal Society Kan Tong Po Visiting Professorship
Royal Society
2009

Runner up Times Higher Education Young Scientist of the Year and Most Entrepreneurial Scientist □00□, □nited Kingdom

UKSEC and Science Alliance of the Netherland
2007

Monbusho Visiting Professorship
Gifu University (Japan)

Nano Electronics Centre - Finalist Emerging Technologies
IEE Awards
Innovation in Engineering

Albert Einstein Silver Medal and Javed Husain Pri□e
UNESCO
2003

Awarded for contributions to electronic devices.

IEE Achievement Award
Institute of Electrical Engineers
2003

Charles Vernon Boys Medal
Institute of Physics
2002

Cambridge Commonwealth Trust Scholarship
Cambridge Commonwealth Trust
1990

Overseas Research Scholarship
Cambridge University
1990

Certifications

Fellow
The Royal Academy of Engineering

Fellow
Royal Society for the encouragement of Arts, Manufactures and Commerce (The RSA)

Fellow
National Academy of Sciences Sri Lanka

Fellow
Institution of Engineering and Technology (IET)

Fellow
Institute of Physics

Chartered Engineer
Institution of Engineering and Technology (IET)

Chartered Physicist
Institute of Physics

Fellow
Cambridge Commonwealth Trust
Starting 1991

Fellow
Cambridge Philosophical Society

Publications

Several - see below
For all journal and paper publications see link
http www.surrey.ac.uk ati nec people ravi silva pubTypeJournal article

Properties of Amorphous Carbon
IET
2003

A critical look at organic photovoltaic fabrication methodology: Defining performance enhancement parameters relative to active area

Elsevier

July 2014

In this paper we report the analysis of large organic photovoltaic (OPV) data sets (0.64 cm2) by revealing the most promising fabrication methodology where we proved that masking OPV can artificially boost power conversion efficiency through fill factor and current density and also with minimal mask si□e (50□ active area) this effect can be eliminated. This paper shows a reliable method to characterise OPV devices without artificially boosting the power conversion efficiency.

Authors□Professor Ravi Silva, Michail Beliatis, Lynn Ro□anski, Keyur Gandhi, Imalka Jayawardena, Damitha Adikaari

High luminance organic light-emitting diodes with efficient multi-walled carbon nanotube injectors

Carbon

September 2012

We report on high luminance organic light-emitting diodes using acid functionali□ed multi-walled carbon nanotube (o-MWCNTs) as efficient hole injector electrodes, using a simple, solution processable device structure. At only 10 V, the luminance approaches 50,000 cd□m2 with an external □uantum efficiency over 2□ and a current efficiency greater than 21 cd□A. The investigation of hole-only devices shows that the mechanism for hole injection changes from injection limited to bulk limited because of the higher effective work function of the anode modified by the o-MWCNTs. We expect the enhancement of the local electric field, brought about by both the dielectric inhomogeneities within the o-MWCNT containing anode and the high aspect ratio carbon nanotubes, improves hole injection from the anode to the organic active layer at much lower applied voltage.

Authors□Professor Ravi Silva, Shengwei Shi

Solution-Processable Graphene Oxide as an Efficient Hole Injection Layer for High Luminance Organic Light-Emitting Diodes

Journal of Materials Chemistry C

March 2013

The application of solution-processable graphene oxide (GO) as a hole injection layer in organic light-emitting diodes (OLEDs) is demonstrated. High luminance of over 53 000 cd m−2 is obtained at only 10 V. The results will unlock a route to apply GO in flexible OLEDs and other electrode applications.

Authors□Professor Ravi Silva, Shengwei Shi, Reda Moubah, Guy Schmerber

Graphene oxide hole transport layers for large area, high efficiency organic solar cells

Applied Physics Letters

August 2014

Graphene oxide (GO) is becoming increasingly popular for organic electronic applications. We present large active area (0.64 cm2), solution processable, poly□9-(1-octylnonyl)-9H-carba□ole-2,7-diyl□2,5-thiophenediyl-2,1,3-ben□othiadia□ole-4,7-diyl-2,5-thiophenediyl□□6,6□Phenyl C71 butyric acid methyl ester (PCDTBT□PC70BM) organic photovoltaic (OPV) solar cells, incorporating GO hole transport layers (HTL). The power conversion efficiency (PCE) of ∼5□ is the highest reported for OPV using this architecture. A comparative study of solution-processable devices has been undertaken to benchmark GO OPV performance with poly (3,4-ethylenedioxythiophene) poly(styrenesulfonate) (PEDOT□PSS) HTL devices, confirming the viability of GO devices, with comparable PCEs, suitable as high chemical and thermal stability replacements for PEDOT□PSS in OPV.

Authors Professor Ravi Silva, Chris Smith, Chris Mills, Imalka Jayawardena, Michail Beliatis, Lynn Ro anski, Rhys Rhodes

Hybrid and Nano-composite Carbon Sensing Platforms

Carbon For Sensing Devices (Springer)

Authors Professor Ravi Silva, Michail Beliatis, Lynn Ro anski, Imalka Jayawardena, Rhys Rhodes, Jose Anguita, Chris Mills

Hybrid Graphene-Metal Oxides Solution Processed Electron Transport Layers, for large Area High Performance Photovoltaics

Advanced Materials

January 2014

Solution processed core–shell nano-structures of metal oxide-reduced graphene oxide (RGO) are used as improved electron transport layers (ETL), leading to an enhancement in photocurrent charge transport in PCDTBT PC70BM for both single cell and module photovoltaic devices. As a result, the power conversion efficiency for the devices with RGO-metal oxides for ETL increases 8 in single cells and 20 in module devices.

Authors Professor Ravi Silva, Michail Beliatis, Keyur Gandhi, Lynn Ro anski, Rhys Rhodes, Liam McCafferty, Mohammad Alene i, Abdullah Alshammari, Chris Mills, Imalka Jayawardena, Simon Henley

Decoration of Multiwalled Carbon Nanotubes with Protected Iron Nanoparticles

Carbon

November 2014

A method to simultaneously synthesi e carbon-encapsulated magnetic iron nanoparticles (Fe-NPs) and attach these particles to multi-walled carbon nanotubes (MWCNT) is presented. Thermal decomposition of cyclopentadienyliron dicarbonyl dimer (C5H5)2Fe2(CO)4, over a range of temperatures from 250 C to 1200 C, results in the formation of Fe-NPs attached to MWCNT. At the same time, a protective carbon shell is produced and surrounds the Fe-NPs, covalently attaching the particles to the MWCNT and leading to resistance to acid dissolution. The carbon coating varies in degree of graphitisation, with higher synthesis temperatures leading to a higher degree of graphitisation. The growth model of the nanoparticles and subse uent mechanism of MWCNT attachment is discussed. Adsorption potential of the hybrid material towards organic dyes (Rhodamine B) has been displayed, an indication of potential uses as material for water treatment. The material has also been electrospun in to aligned nanocomposite fibres to produce a soft magnetic composite (SMC) with future applications in sensors and fast switching solenoids.

Authors Professor Ravi Silva, Liam McCafferty, vlad stolojan, Simon G King, wei hang, sajad ha

Highly Aligned Arrays of Super Resilient Carbon Nanotubes by Steam Purification

Carbon

Steam treatment has been applied to our prefabricated highly aligned areas of electrospun carbon nanotube composite nano-fibres, leading to controlled and targeted removal of polymeric and amorphous carbon materials, resulting in areas of highly aligned, highly crystalline, pure nanotubes. Raman analysis suggests that some carbon nanotubes are more resistant to steam assisted oxidation, meaning that specific carbon nanotube diameters are preferentially oxidised. The remaining carbon nanotubes have displayed a significant improvement in both uality, with respect to defect density, and in crystallinity, resulting in an increased resistance to oxidation. These steam treated super resilient carbon nanotubes are shown to withstand temperatures of above 900 C under ambient conditions. Applying this purification method to electrospun nano-fibres leads the way for the next generation of composite materials which can be used in high temperature extreme environments

Authors□Professor Ravi Silva, Simon G King, Liam McCafferty, Vlad Stolojan

Filtration properties of hierarchical carbon nanostructures deposited on carbon fibre fabrics

Journal of Physics D□Applied PhysicsEmail alert RSS feed

January 2015

Hierarchical carbon nanostructures have been produced and examined for their use in li□uid filtration experiments. The nanostructures are based on carbon nanotube growth and graphite oxide sponge deposition on the surface of commercially available carbon fibre fabrics.

Authors□Professor Ravi Silva, Chris Smith, Magdalena Kur□yp, Chris Mills, Rhys Rhodes, Thomas Po□egic, Michail Beliatis, Lynn Ro□anski

Fullerene and nanotube formation in cool terrestrial ‘‘dusty plasmas’’

Applied Physics Letters 73 (21) 3082-3084

1998

Work on plasma-deposited carbon thin films and dust yielded further papers, including□
- "Enhancing the field emission properties of amorphous carbon films by thermal annealing", AP Burden, RD Forrest, SRP Silva□Thin Solid Films 337 (1), 257-260
- "Microstructural characterisation of carbonaceous dust generated during the deposition of diamond-like carbon coatings" AP Burden, JV Anguita, SRP Silva□Thin solid films 332 (1), 252-256
- "In-situ surface texturing of conductive polymer composite substrates for field-emission applications"
AP Burden, RD Forrest, SRP Silva□Journal of Materials Science Letters 17 (17), 1467-1470
- "Fullerene-like carbon nanoparticles generated by radiofre□uency plasma-enhanced chemical vapour deposition" AP Burden, SRP Silva□Philosophical Maga□ine Letters 78 (1), 15-19
- "The stability of nitrogen-containing amorphous carbon films after annealing at moderate temperatures" AP Burden, E Mendo□a, SRP Silva, GAJ Amaratunga□Diamond and Related Materials 7 (2), 495-498

Authors□Professor Ravi Silva, Adrian Burden

The Role of Substituent Effects in Tuning Metallophilic Interactions and Emission Energy of Bis-□-□□-pyridyl□1,□,□-tria□olatoplatinum□II□Complexes

Angewandte Chemie International Edition, 2015, 54, 7949–7953.

June 2015

Authors□Professor Ravi Silva, Ranga Prabhath, Julia Romanova, Richard J. Curry, Peter Jarowski

High efficiency air stable organic photovoltaics with an a□ueous inorganic contact

Nanoscale

July 2015

We report a □nO interfacial layer based on an environmentally friendly a□ueous precursor for organic photovoltaics. Inverted PCDTBT devices based on this precursor show power conversion efficiencies of 6.8–7□ . Unencapsulated devices stored in air display prolonged lifetimes extending over 200 hours with less than 20□ drop in efficiency compared to devices based on the standard architecture.

Authors□Professor Ravi Silva, Imalka Jayawardena, Chris Smith, Michail Beliatis, Keyur Gandhi, Thomas Po□egic, Dinesha Dabera, Lynn Ro□anski, Radu Sporea, Chris Mills

Electron Field Emission from Water-Based Carbon Nanotube Inks

ECS Journal of Solid State Science and Technology

February 2015

Printable electron field emitters could lead to cheap and scalable large area electron sources. This paper presents work on electron field emission from water-based multiwall carbon nanotube (MWCNT) dispersions, and introduces new results on emission from different substrates. We summari□e work in which MWCNTs are deposited onto paper, glass, and plastic substrates, and show that the field emission characteristics can be tailored by controlling the underlying morphology as well as by post-laser irradiation. We also show that engineering the work function of MWCNTs can significantly enhance field emission, and that resonant tunneling effects may be induced by suitable surface functionali□ation.

Authors□Professor Ravi Silva, Stephen Lyth

Languages

Sinhalese

Skills

Nanotechnology | Nanomaterials | Carbon Nanotubes | Solar Cells | Photovoltaics | Optoelectronics | Renewable Energy | Nanofabrication | large area electronics | electroluminescent cells | Thin Film... | Power Electronics | Scanning Electron... | solid state electronics | Technology Strategy &...

See 25□

Education

□niversity of Cambridge

Doctor of Philosophy (Ph.D.), Electrical and Electronics Engineering

1991 – 1994

Large Area Electronics, Semiconductor materials

□niversity of Cambridge

Master of Arts (M.A.), Electrical and Electronics Engineering

1990 – 1991

□niversity of Cambridge

Bachelor of Arts (B.A.), Electrical and Information Sciences Tripos (EIST)

1987 – 1990

Clare College

Activities and Societies□Athletics (Achilles Club), College Rowing, Chess, Tennis

DS Senanayake College, Colombo

Activities and Societies: Athletics - National Colours and National Records

Recommendations

A preview of what LinkedIn members have to say about Professor Ravi:

“Very friendy. Very knowledgeable. All round nice person. Has achieved great things and well known in his field of expertise. Ravi is world expert in nanotechnology, keep up the good work Ravi!.”

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Groups

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Vacuum Coating **The niversity of Sur…** **Nanotechnology Glo…**

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