

7th World Congress of MIRCE Science

Woodbury Park, Exeter, United Kingdom, 19 – 21 June 2018

MIRCE Science Philosophy	09.00	19.06.2018	ON TIME
MIRCE Science Mechanics	09.00	20.06.2018	ON TIME
MIRCE Science Mathematics	09.00	21.06.2018	ON TIME

HOUSTON CONTINENTAL 1505 3:15P 6 ON TIME

MIRCE Akademy Go To Exeter ON TIME

ISLIP NY DELTA 2310 2:55P 96 ON TIME

KANSAS CITY MO SOUTHWEST 109 4:35P 122 ON TIME

LONDON HEATHROW UNITED 918 2:19P 42 BOARDING

LOS ANGELES DELTA 333 3:25P 73 ON TIME

LOS ANGELES SOUTHWEST 143 3:40P 126 ON TIME

LOS ANGELES UNITED 331 4:35P 60 ON TIME

“Airlines are in the transportation business; Boeing, Douglas, Lockheed, Airbus, they're in the airplane business. You must keep equipment available, you can have the shiniest looking airplane in the world, the most remarkably engineered airplane in the world, it's an academic marvel, it's an engineering marvel, but if the damned thing is not at B3 in Chicago at 9.15 to originate the trip to Cleveland, forget it.”

Jack Hessburg (1934-2013) Grand Fellow of the MIRCE Akademy, Exeter, UK

The Congress Programme: Tuesday 19th June 2018

0830- 0900	Registration and welcome coffee, Woodbury Park Hotel,
0900-0905	Welcome by Dr Knezevic, Founder & President of the MIRCE Akademy
0900 -1300	<p>MIRCE Science Philosophy Dr J. Knezevic, MIRCE Akademy, Exeter, UK</p> <p>The philosophy of MIRCE Science is based on premises that the “purpose of existence” of any human created system is the delivery of a positive functionability work, which means delivery expected functionality (function, performance and attributes) through in-service time. This, life long, process is associated with the demand for resources, such as: personnel, material, faculties, energy and so forth. Monetary value of resources consumed constitutes positive functionability cost. Complementary work done, named negative functionability work, is associated with positive functionability actions, performed by humans while a system is being in negative functionability state. Monetary value of resources consumed, like personnel, spare parts, material, tools, equipment, faculties, data, energy and so forth, constitutes negative functionability cost.</p> <p>Consequently, the main objective of any user is to obtain a system which will deliver the best functionability performance, which means the highest possible ratio between the positive functionability work done and the total functionability cost, over its life. Clearly, this information becomes known, well after the retirement of a system. However, this ratio is predetermined by the future consequences of decisions made during the creation of a system. Hence, MIRCE Science is a theory, devoted by Dr Knezevic, that enables accurate predictions of functionability performance of the future systems to be made, as the time when all changes are possible, at very little extra time and cost. During this presentation the author will discuss the 50 year journey that he travelled while developing MIRCE Science.</p>
Coffee Break 10.30-11.00	
1300 -1400	Lunch
14.00-17.30	<p>An overview of Axioms, Equations and Methods of MIRCE Science Dr J. Knezevic, MIRCE Akademy, Exeter, UK</p> <p>The theoretical body of knowledge that constitutes MIRCE Science, consists of the following major parts:</p> <ul style="list-style-type: none"> • 6 Axioms • 2 Functionability: States, Events and Actions • 1 Functionability Field • 1 MIRCE Space • 5 Functionability Equations <p>During this presentation, Dr Knezevic will explain the meaning of the above listed terms and concepts, and will illustrate each of them with numerous real life examples, covering systems like: Formula 1 cars, commercial/military aircraft, nuclear power stations, international space station, etc.</p>
Tea Break 15.15-15.45	
1900-2200	<p>Traditional English Fish & Chips in the Traditional English Pub XVII Century English Pub, Topsham (5 miles from Woodbury Park, transport provided)</p>

The Origin of MIRCE Science



Jezdimir Knezevic

This book is about the journey over the road that the author has travelled since birth till today, but it is not a book about him; it is a book about the quest for the new body of knowledge that he named MIRCE Science. This journey consisted of two paths:

- Childhood obsession with cars and autosport, progressing to building one by hand, using parts obtained from scrap yards, in a neighbour’s garden. Two years later driving that car he earned one point in the Yugoslav Rally Championship, while experiencing the physical reality of operation, maintenance and support processes.
- The second took the author to universities, libraries, institutes, companies and other organisations worldwide, in the quest for relevant knowledge of science and mathematics, the complexity of which, according to Jack Hessburg (1934-2013), the World’s first Chief Mechanic (Boeing 777), required the intellectual effort equal to winning a Nobel Prize!

Both paths converged 40 years later to form MIRCE Science, the theory for predicting functionability performance of functionable system types by applying Functionability, Operability, Maintainability, Supportability and Profitability Equations, the mathematical derivation of which has been described in this book.

The Congress Programme: Wednesday 20th June 2018

08.30-09.00	Registration and welcome coffee, Woodbury Park Hotel
<p>09.00-13.00</p> <p>Coffee Break 10.30-11.00</p>	<p>Positive and Negative Functionability Actions in MIRCE Science Dr J. Knezevic, MIRCE Academy, Exeter, UK</p> <p>Motion of functionability system type through MIRCE Space is govern by the acting physical mechanism(s) or human activities. Hence, this presentation is analysing both of them, with in the scale 10^{-10} to 10^{10} of a metre in order to understand the guiding mechanisms of functionability actions, behaviour of which have to be adequately defined in order to predict the functionability performance of a given system type.</p> <p>In MIRCE Science all negative functionability actions are categorised as following:</p> <ul style="list-style-type: none"> • Component-internal actions that consist of: <ul style="list-style-type: none"> ○ Inherent actions, from the design, through predication and maintenance ○ Cumulative continuous decay (creep, fatigue, wear. Corrosion, abrasion, etc.) • Component-external actions, which are originated by: <ul style="list-style-type: none"> ○ Environmental phenomena ○ Human activities: Errors and Rules (organisational, legal, best practices etc.) • System-internal actions: resulting from processes that are taking place within a system, like a change from passive to active state for certain components and modules, a change in functionability states of some of its constituent components that impact the functionability of the system. • System-external actions: which are generated by: <ul style="list-style-type: none"> ○ Discrete environmental phenomena (earthquake, solar radiation, bird-strike, etc.), <ul style="list-style-type: none"> ▪ Human activities: Errors (operators, maintainers) and Rules
13.00-14.00	Lunch Break
<p>14.00-17.00</p> <p>Coffee Break 15.15-15.45</p>	<p>In MIRCE Science all positive functionability actions are categorised as following:</p> <ul style="list-style-type: none"> • System-Internal actions, commonly known as maintenance tasks, are further categorised as following¹: <ul style="list-style-type: none"> ○ Servicing: replenishment of consumable fluids, cleaning, washing and similar. ○ Lubrication: installing or replenishing lubricant. ○ Inspection of a component against a defined physical standard. <ul style="list-style-type: none"> ▪ General visual ▪ Detailed visual (intensive visual search for evidence of any irregularity) ▪ Special visual inspection: which usually required special inspection equipment such as radiography, thermography, dye penetrant, eddies current, high power magnification or other NDT. ○ Examination: a quantitative assessment of one/more functions on a component to determine whether it performs within acceptable limits. ○ Restoration: perform to return a component to a specific standard. This may involve cleaning, repair, replacement or overhaul. ○ Discard: removal of from in-service life. • System-External actions: related to activities that are affecting the whole functionable systems and I grouped them in the following manner: <ul style="list-style-type: none"> ○ Environmental positive actions: fog lifting, de-icing, decontamination, washing and so forth. ○ Legal positive actions: related to all activities that are required to be performed due to health and safety regulations at national and international level of jurisdictions and restrictions ○ Organisational positive actions those are specific to a user or group of users of functionable systems, which could relate to marketing, operational, political, economical and other functions. <p>During this presentation each functionability action will be explain and illustrated with real life cases, like: F1 cars, commercial/military aircraft, nuclear power stations, international space station, etc</p>
19.00-23.00	<p>Sherry Reception Gala Dinner – 7th Congress of MIRCE Science The MIRCE Academy Fellowship Awards Ceremony</p>

The Congress Programme: Thursday 21st June 2018

08.30-09.00	Registration and welcome coffee, Woodbury Park Hotel
09.00-10.30	MIRCE Science Mathematics
	<p>Calculation of the probability of a functional system successfully completing the next active period, far beyond the first failure John Thompson, Science Fellow of the MIRCE Akademy, Exeter, UK</p> <p>This presentation will present the methods used to model the positive and negative functionality states of a system, driven by the internal states of consisting components, based on the system truth table. The model is event simulation of an occurrence of any positive and negative functionality events of system (failures or repairs), far beyond the first failure of a system. The author has used event simulation because the mathematics needed to compute these results are extremely difficult, due to many convoluted integrals. However, the current computing power available in most desk top computers the modelling is available to all. Also, with event simulation it is very easy to change input parameters and plot the results through time and see the upper and lower limits of the parameter that define the functionality performance of a system type.</p>
10.30-11.00	Coffee Break
11.00-13.00	<p>Predicting Maintenance Actions Errors: No Fault found and False Passes John Thompson, Science Fellow of the MIRCE Akademy, Exeter, UK</p> <p>Current availability modelling assumes engineers are 100% efficient at detecting and correcting a fault. The author will introduce a new model of the outcomes of a maintenance action with error terms, such as: no fault founds and false passes. The author has achieved this by combining the system event simulation with the new model for maintenance action outcomes. Results suggest that period between maintenance actions effects the number of failures found. The equation to model this phenomenon will be introduced by the author. This equation allows for the correct calculation of the underlying statistics of functionality performance measures, based on the observed data, like: maintenance period, total time and number of failures found.</p>
	Lunch Break
14.00-15.30	<p>Open Discussion on the impact of the New Technologies on MIRCE Science:</p> <ul style="list-style-type: none"> • <i>Computational Methods</i> • <i>Data Management Tools</i> • <i>Condition Monitoring Techniques</i> • <i>Environmental Conditions Predictions (Earth and Space Weather)</i> • <i>Human Errors Reduction Methods</i> • <i>Mathematical Techniques</i> • <i>Quantum Mechanics Understandings of Functionability Phenomena</i> • <i>Communication Systems</i> • <i>Documentation and Implementation of Lessons Learned</i>
	2018 Group Photograph
15.30-1600	Tea and Departure



“The main objective of the Congress is to bring together scientists, mathematicians, engineers, operators, maintainers, logisticians, programmers, economists and other experts to spend a few days together and learn the complexity of the process govern by the MIRCE Science Equations and to identify the consequences of their specialist decisions on the future performance of maintainable systems.

I am looking forward to welcoming you to the MIRCE Akademy, during this unique global event, as a paper presenter, master class presenter, exhibitor, sponsor or participant.” Dr J. Knezevic. Founder & President

Administrative and Financial Information

For the planning purpose, of the participants, exhibitors and presenters, the following Price structure will be applied regarding all services related to the 7th World Congress of MIRCE Science.

Service Available	Cost			After 15th May 2018		
	Price	VAT	Total	Price	VAT	Total
All prices are in GB Pounds						
Participant for 3 Days	595.00	119.00	714.00	645.00	129.00	774.00
Participant per Day	225.00	45.00	270.00	275.00	55.00	330.00
Presenter on the day of presentation	Free			Free		
Presenter for 3 Days	300.00	60.00	360.00	325.00	65.00	390.00
Retired participants for 3 Days	195.00	39.00	234.00	195.00	39.00	234.00
University students for 3 Days	395.00	79.00	474.00	495.00	99.00	594.00
Congress Proceedings on CD	175.00	35.00	210.00	175.00	35.00	210.00
MIRCE Akademy Members	550.00	110.00	660.00	575.00	115.00	690.00
MIRCE Akademy Fellows	575.00	115.00	690.00	595.00	119.00	714.00
MIRCE Akademy Students	495.00	99.00	594.00	525.00	105.00	630.00
Partners Programme for 3 Days	195.00	39.00	234.00	195.00	39.00	234.00
Congress Dinner only	62.50	12.50	75.00	62.50	12.50	75.00
Sherry, 3 course meal & wine						
Exhibitors - Gold Package	5000.00	1000.00	6000.00	5500.00	1100.00	6600.00
Exhibitors - Silver Package	3000.00	600.00	3600.00	3000.00	600.00	3600.00
Exhibitors - Bronze Package	1500.00	300.00	1800.00	1500.00	300.00	1800.00
B&B at Woodbury Park Hotel - single	Rooms are		75.00	Rooms are		75.00
B&B at Woodbury Park Hotel - double	guaranteed		95.00	guaranteed		95.00

VALUE ADDED TAX (VAT):

Unless special exemption exists, under UK Customs and Excise regulations delegates from all countries are required to pay UK VAT @ 20% on all courses taking place in the UK. Non-UK delegates may be able to recover VAT incurred via the relevant tax authority in the country of origin of the delegate.

Terms and Conditions

Substitution of participants may be made at any time. If you intend to do this, please advise the MIRCE Akademy ('the organiser') as soon as possible. Cancellation of a booking must be received in writing by the organiser at least 14 days before the commencement of the Congress. The MIRCE Akademy regrets that no refunds or credits will be made after the deadline unless the organiser cancels the Congress. The organiser reserves the right to alter the programme or cancel the Congress at its discretion. All places offered are subject to availability.

For any other information please contact us:

Phone: + 44 (0)1395 233 856
Email: quest@mirceakademy.com
Website: www.mirceakademy.com



About the Venue

Woodbury Park is a magnificent 500 acre complex set among rolling hills above the South West English coastline, only a few miles from Exeter.

Communication between Exeter and other parts of the United Kingdom are excellent. **By road**, the M5 motorway links Exeter to London, the Midlands, Scotland and Wales. Regular rapid coaches run services to and from London and Heathrow Airport. **By rail**, a regular fast service is available to and from Exeter (St David's Station) and London (Paddington Station). **By air**, Exeter Airport offers regular flights to many British and Continental destinations and is situated near to Woodbury Park.

Travel between Exeter and Woodbury normally requires a car or taxi.

Among the outstanding leisure facilities at Woodbury Park are two golf courses including the magnificent **Oaks Championship course**, tennis courts, a swimming pool, spa, sauna and fully equipped gymnasium and well appointed lounge areas and bars.

Woodbury Park, Exeter, EX5 1JJ, UK

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✉ enquiries@woodburypark.co.uk

🌐 www.woodburypark.co.uk

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Exeter is the most southwesterly Roman fortified settlement in Britain. Exeter Cathedral was founded in the early 12th century and has several notable features, including an early set of misericord, an astronomical clock and the longest uninterrupted vaulted ceiling in England. **Today**, Exeter is identified as one of the top ten most profitable locations for a business to be based.



Woodbury Park Hotel & Golf Club, Exeter, EX5 1JJ, UK – home of the MIRCE Akademy

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BOOKING FORM

Email: quest@mirceakademy.com

Phone: +44 (0) 1395 233 856

Mail: MIRCE Akademy, Woodbury Park, Exeter, EX5 1JJ, United Kingdom

Web site: www.mirceakademy.com

THIS FORM MAY BE COPIED

Please select appropriate level of service and corresponding fee.

Group discounts are available please contact us.

The Symposium Fees includes:

- Attendance
- Congress Papers and Supporting Materials
- Lunches and Light Refreshments
- Gala Dinner on 20th June
- Richard Bader Memorial Lecture
- Fish & Chips Event on 19th June

Value Added Tax (VAT)

Unless special exemption exists, under UK Customs and Excise regulations delegates from all countries are required to pay UK VAT @ 20 % on all courses taking place in the UK. Non-UK delegates may be able to recover VAT incurred via the relevant tax authority in the country of origin of the delegate.

PAYMENT DETAILS

Please invoice my organisation (**Note: UK MOD personnel can pay by BACS through the DBA – Contractor Number will be supplied with invoice**)

For the attention of _____

Purchase Order No. _____

Please Charge credit card £ _____

Visa MasterCard Amex

Cardholder _____

Card No. _____

Expiry Date _____ Security Number _____

Signature _____

PERSONAL DETAILS (Please print clearly)

Surname _____

First name _____

Organisation _____

Department _____

Position _____

Address _____

Postcode _____ Country _____

Tel _____ Fax _____

E-mail _____

Special requirements Yes No

Please specify

I understand and accept the registration terms and conditions as shown

Signature _____ Date _____

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The organiser reserves the right to alter the programme or cancel the Summer School at its discretion. All places offered are subject to availability.