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# KRISHNASWAMI (KRIS) RAJENDREN

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Visa Status F-1 Degree MS Job Preference Full-time www.krishnarajendren.com

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**PENN STATE Graduate** student with a background in process innovation for the energy industry. I have an understanding of the oil and gas business through my experience in developing technology for computational screening of novel materials for **Royal Dutch Shell**. I am passionate about creative problem solving and leveraging the solution to maximize its business impact. I bring with myself the following technical, business and leadership skills:

*Reservoir Modeling & Simulation*  
*Reservoir Optimization*  
*Reservoir Management*  
*Process Modeling & Simulation*  
*Process Equipment Design*

*Molecular Modeling & Simulation*  
*Molecular Dynamics & QSPR*  
*Statistical Analysis*  
*Software Process Automation*  
*Numerical Programming*

*Product Development*  
*Technical Reporting & Marketing*  
*Business Proposal Writing*  
*Inter-disciplinary Problem Solving*  
*Cross-cultural Communication*

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## EDUCATION

**MS Petroleum & Natural Gas Engineering**

**PENNSYLVANIA STATE UNIVERSITY**

Jan 2014 – Jun 2016 (Exp) **3.5/4**

### Research

**Artificial Neural Network Model for Cyclic Steam Stimulation** in Fractured Heavy Oil Reservoirs

### Selected Projects

Black-oil Reservoir Simulation Tool (**BloSim**)  
Phase Behavior Modeling Tool (**HyFuCal**)

**ME Chemical Engineering**

**INDIAN INSTITUTE OF SCIENCE BANGALORE**

Aug 2005 – Jul 2007 **7.3/8**

### Research

Modelling viral-cell membrane fusion to **Optimize Dosage** of Fusion Inhibitors for **HIV anti-retroviral Therapy**

### Selected Projects

Age-structured **Population Balance** Model for **HIV Infections**  
Generalized **Quasi-species** Model for **Natural Selection**

**BTECH Chemical Engineering**

**INDIAN INSTITUTE OF TECHNOLOGY MADRAS**

Aug 2001 – Jul 2005 **7.0/10**

### Project

Experimental study of two-phase, air-water, flow regimes in pipes with a focus on churn flow

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## HONORS AWARDS & KEY ACHIEVEMENTS

Secured <b>3<sup>RD</sup></b> Position in <b>Society of Petroleum Engineers'</b> Student Paper Contest at <b>Penn State</b>	<i>Spring 2015</i>
<b>GRE</b> score <b>158</b> Verbal, <b>168</b> Quant ( <b>95 percentile</b> ) and <b>4.0</b> Analytical Writing. <b>TOEFL iBT 110 / 120</b>	<i>Dec 2012</i>
Awarded <b>Vantage Award</b> for <b>Leadership</b> in Health, Safety, and Environment (Royal Dutch Shell)	<i>Dec 2009</i>
Awarded <b>Special Recognition Award</b> (Royal Dutch Shell) for contributions to safety	<i>Dec 2009</i>
Awarded <b>Special Recognition Award</b> (Royal Dutch Shell) for contributions in <b>Oil Sands</b> project	<i>Dec 2008</i>
Secured <b>First Class with Distinction</b> in <b>ME</b> at <b>Indian Institute of Science</b> Bangalore	<i>Aug 2007</i>
Awarded <b>Graduate Research Scholarship</b> for <b>ME</b> at <b>Indian Institute of Science</b> Bangalore	<i>Aug 2005</i>
Achieved All India Rank <b>13</b> in <b>Graduate Aptitude Test</b> in Chemical Engineering ( <b>99.78 percentile</b> )	<i>Aug 2005</i>
Achieved All India Rank <b>1115</b> in <b>IIT-JEE 2001</b> amongst 250,000 students ( <b>99.6 percentile</b> )	<i>Aug 2001</i>

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## PROFESSIONAL EXPERIENCE

*Technology Development Engineer*

**ROYAL DUTCH SHELL PLC**

Aug 2007 - Apr 2010

### Process-aids for Athabasca Oil Sands Project

- 3 **Developed** a quantitative structure performance relationship (QSPR) model to rank and screen process-aids that can improve bitumen extraction in Clark's Hot Water Based Extraction Process for **Oil Sands** through a reduction in slurry viscosity
- 3 **Automated** the software process, in Accelrys, to calculate molecular descriptors using Perl Scripting
- 3 **Developed** and screened a database of **450** chemicals and recommended the **top 10** candidates to business for **plant trial**
- 3 **Coordinated** and managed the molecular modelling efforts in a cross-functional, multi-country project spanning 3 businesses: Shell Canada, Shell Global Solutions and Avantium Technologies BV with members in 3 countries

- 3 **Proposed** repeat work for detailed molecular simulations studying clay-process-aid-bitumen interactions and secured funding of **250,000 USD** from Shell Innovation and Research

#### Surfactants for **Chemical EOR**

- 3 **Directed** strategic re-alignment of the team with that of Shell Global strategy of *more upstream profitable downstream*
- 3 **Marketed** Computational Chemistry services to the CEO and other upstream group leaders at **Interfacial Science** cluster
- 3 **Proposed** QSPR capability to screen surfactants for Enhanced Oil Recovery (**EOR**) and secured **300,000 USD** from the Shell Science Cluster funding
- 3 **Developed** an application to calculate Molecular Thermodynamic properties of surfactants manufactured by **Shell Chemicals**

#### Additives to **Shell Sulfinol-X** Solvents for Sour Gas Extraction

- 3 **Attracted** funding of **50,000 USD** from **Shell Global Solutions**, upstream flow assurance group (**GSUF**), to screen additives for the **Sulfinol-X** family of solvents that were being tested for sour gas extraction by **Shell Gas and Power**
- 3 **Proposed** development of a tool based on thermodynamic calculations using Shell proprietary software **ST-Flash** and **UNIFAC** group contribution methods to screen novel additive molecules
- 3 **Coordinated** modelling efforts across **GSUF Amsterdam**, **GSUF India** and **Shell Gas and Power** teams

#### Goal Zero Champion for Health Safety Security and Environment (HSSE)

- 3 **Lead** the ergonomic program roll-out and monitored compliance for the Computational Chemistry team
- 3 **Developed** and **implemented** the hand-rail safety campaign which was recognized with **Shell HSSE Vantage Award**

*Equity Trader*

**TILDA INC.**

Apr **2010** - Dec **2013**

- 3 **Invested** in a portfolio of 75 companies listed in the Indian Stock Exchange based on their historical performance
- 3 **Achieved** an average annual return on investment of over 20% for 3 consecutive years

*Graduate Researcher Biophysics*

**INDIAN INSTITUTE OF SCIENCE BANGALORE**

Aug **2006** – Jul **2007**

- 3 **Modeled** kinetics of protein binding across **HIV-T-cell** membranes to optimize fusion inhibitor dosage in therapy for **AIDS**

*Industry Internship*

**BHARAT HEAVY ELECTRICALS LTD**

Jun **2005** - Jul **2005**

- 3 **Designed** a spray condenser for the once-through supercritical boiler test-rig using transient heat conduction modeling

## **PROGRAMMING LANGUAGES & SOFTWARE PACKAGES**

*MATLAB*   **C**   *Perl*   *FORTRAN*   **C++**   **Java**   **Swift**   **HTML5**   **CSS**   *JavaScript*

**CMG** *IMEX* *GEM* *WinProp* *STARS* **Aspen-Plus** **COMSOL** *Accelrys* *Materials Studio* *QSAR* **Microsoft** *Word* *Excel* *PowerPoint*

## **EXTRACURRICULAR & VOLUNTEERING ACTIVITIES**

Weight Training   Yoga (**RYA 200** HR Instructor)   Swimming   Water Polo   Table Tennis   Carroms

**2 Silvers** in **Swimming** Relay   **1 Silver** & **1 Gold** in **Water Polo**   **1 Silver** in **Bridge** at **IIT Madras** inter-hostel Sports (**2004-05**).

- 3 **Vedic** and **Sanskrit** scriptural recitation in Indian temples while learning **yoga**, **meditation** and deeper aspects of the Indian culture from a master in southern India (**2004 - 2010**)
- 3 **Produced** high-definition **documentaries** of temple events stored in the archives of Kolahalan Temple in Tamil Nadu
- 3 **Developed** e-book & audio **databases** of documents & lectures expounding key Vedic scriptures and associated yogic and tantric rituals **easily accessible** on devices like **iPad** making it possible for the user, typically Vedic scholars, practicing priests and yogis, to tap into a multitude of sources otherwise difficult to achieve with hard copies

### **LANGUAGES**

**Bilingual** English Hindi

**Intermediate** Tamil

**Beginner** Urdu Sanskrit