Md Nazmul Azim Beg, Ph.D.

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SUMMARY

Technical expertise and academic proficiency in hydraulics, computational fluid dynamics, river & coastal engineering, urban drainage, and mathematical modeling with different modeling tools.
Worked on several projects associated with flood management, urban drainage, river and coastal morphology, salinity intrusion, survey monitoring, etc.

EDUCATION

Ph.D. Civil Engineering - Hydraulics, Water Resources and Environment (February 2019)
University of Coimbra, Portugal
Thesis: Detailed Uncertainty Analysis of Urban Hydraulic Structures in Large Catchments (https://doi.org/10.5281/zenodo.3246851)
Supervisor: Prof. Rita F. Carvalho (University of Coimbra, PT) and Dr. Jorge Leandro (Technical University of Munich, DE)

M.Sc. Hydroinformatics and Water Management (September 2013)
Joint M.Sc. from University of Nice Sophia Antipolis, FR; Newcastle University, UK; Brandenburg University of Technology, DE
Thesis: Implementation of a 3D model for the North Sea and UK surrounding Area (https://doi.org/10.13140/RG.2.2.20114.04806)
Supervisor: Prof. Frank Molkenthin (Brandenburg University of Technology, DE) and Dr. Rodolfo Bolaños Sanchez (DHI Water Environment Health, DK)

B.Sc. Civil Engineering, major in Water Resources Engineering (October 2009)
Bangladesh University of Engineering and Technology
Thesis: Review of Coastal Embankment in the District of Patuakhali, Bangladesh
Supervisor: Prof. M. Monowar Hossain (Bangladesh University of Engineering and Technology, BD)

PEER-REVIEWED PUBLICATIONS

1. **Beg, M.N.A.**, Rubinato, M., Carvalho R.F., Shucksmith, J., 2020. CFD Modelling of the Transport of Soluble Pollutants from Sewer Networks to Surface Flows during Urban Flood Events. Water, 12, 2514. doi:10.3390/w12092514

2. **Beg, M.N.A.**, Leandro, J., Bhola, P., Konnerth, I., Willems, W., Carvalho R.F., Disse, M, 2019. Discharge Interval Method for Uncertain Flood Forecasts Using a Flood Model Chain: City of Kulmbach. Journal of Hydroinformatics, 21 (5), 925-944. doi:10.2166/hydro.2019.131

3. Leandro J., Gander A., **Beg M.N.A.**, Bhola P., Konnerth I., Willems W., Carvalho R.F., Disse M., 2019. Forecasting upper and lower uncertainty bands of river flood discharges with high

predictive skill. Journal of Hydrology, 576, 749–763. doi:10.1016/j.jhydrol.2019.06.052

4. Beg, M.N.A., Carvalho, R.F., Leandro, J., 2019. Effects of manhole molds and inlet alignment on the hydraulics of circular manhole at changing surcharge. Urban Water Journal, 16(1), 33–44. doi:10.1080/1573062X.2019.1611887

5. Beg, M.N.A., Carvalho, R.F., Tait, S., Brevis, W., Rubinato, M., Schellart, A., Leandro, J., 2018. A comparative study of manhole hydraulics using stereoscopic PIV and different RANS models. Water Science & Technology, 2017(1), 87–98. doi:10.2166/wst.2018.089

6. Muthusamy, M., Tait, S., Schellart, A., **Beg, M.N.A.**, Carvalho, R.F., de Lima, J.L.M.P., 2018. Improving understanding of the underlying physical process of sediment wash-off from urban road surfaces. Journal of Hydrology, 557, 426–433. doi:10.1016/j.jhydrol.2017.11.047

7. Beg, M.N.A., Carvalho, R.F., Leandro, J., 2018. Effect of surcharge on gully-manhole flow. Journal Hydro-environment Research, 19, 224-236. doi:10.1016/j.jher.2017.08.003

8. Rahman, Zia, **Beg, M.N.A.**, Khan, Z.H., 2014. Sediment Budget of Meghna Estuary. Journal of River Research Institute, Faridpur. doi:10.5281/zenodo.3351639

ARTICLES SUBMITTED AND IN PREPARATION

1. **Beg, M.N.A.**, Meselhe, E., Hu, K.; Efficient channel routing using Saint Venant formulation *(in preparation for Journal of Hydraulic Engineering ASCE)*

2. Beg, M.N.A., Carvalho, R.F., Leandro, J., Tait, S., Brevis, W.; Flow Characterization of a surcharged manhole using stereoscopic PIV *(in preparation for Hydraulic Engineering ASCE)*

CONFERENCE PROCEEDINGS & PRESENTATIONS

Peer-Reviewed Proceedings with presentations:

1. Carvalho R.F., **Beg, M.N.A.**, Lopes P., 2019. Experimental and Numerical characterisation of a jet impingement on a pool. 38th IAHR World Congress 2019, 1 - 6 September 2019, Panama City, Panama

2. Carvalho R.F., Lopes P., **Beg, M.N.A.**, Santos, J.A., Fortes, J.C., 2019. Numerical simulations of hydrodynamics in the neighbourhood of a gentler slope breakwater's trunk armour. 38th IAHR World Congress 2019, 1 - 6 September 2019, Panama City, Panama

3. Beg, M.N.A., Leandro, J., Bhola, P., Konnerth, I., Amin, K., Köck, F., Disse, M, 2018. Flood forecasting with uncertainty using a fully automated flood model chain: a case study for the City of Kulmbach, 13th International Hydroinformatics Conference. HIC2018, 1 - 6 July 2018, Palermo Italy

4. Carvalho R.F., Lopes P., **Beg, M.N.A.**, Leandro, J. Performance of different gully bottom pipe outlet characteristics. 5th IAHR Europe Congress: New challenges in hydraulic research and engineering, 12 - 14 June 2018, Trento, Italy

5. Beg, M.N.A., Carvalho, R.F., Leandro, J., Tait, S., Schellart, A., Brevis, W., 2017. Comparison of manhole hydraulics using PIV and different RANS model, in: Marsalek, J., Kabelkova, I. (Eds.), 14th IWA/IAHR International Conference on Urban Drainage. ICUD2017, 10-15 September 2017, Prague, Czech Republic, pp. 241–249.

6. Muthusamy, M., Carvalho, R.F., **Beg, M.N.A.**, Tait, S., Schellart, A., Lima, J.P. de, 2017. Effect of rainfall intensity, surface slope and sediment build-up on sediment wash-off process: An experimental study, in: Marsalek, J., Kabelkova, I. (Eds.), 14th IWA/IAHR International Conference on Urban Drainage. ICUD2017, 10-15 September 2017, Prague, Czech Republic, pp. 109–112.

7. Beg, M.N.A., Carvalho, R.F., Leandro, J., 2017. Comparison of flow hydraulics in different manhole types, in: Ghani, A.A. (Ed.), Managing Water for Sustainable Development: Learning from the Past for the Future: Proceedings of the 37th IAHR World Congress, 13-18 August 2017, Kuala Lumpur, Malaysia, pp. 4212–4221.

8. Beg, M.N.A., Carvalho, R.F., Lopes, P., Leandro, J., Melo, N., 2016. Numerical Investigation of the Flow Field inside a Manhole-Pipe Drainage System, in: Crookston, B., Tullis, B. (Eds.), Hydraulic Structures and Water System Management. 6th IAHR International Symposium on Hydraulic Structures. 27 June – 1 July 2016, Portland, Oregon, USA, pp. 1–11. doi:10.15142/T370628160853

9. Beg, M.N.A., Carvalho, R.F., Leandro, J., Lopes, P., Cartaxo, L., 2016. Investigation of the Flow Field inside a Drainage System: Gully - Pipe - Manhole, in: International Junior Researcher and Engineer Workshop on Hydraulic Structures. 1-5 May 2016, Lübeck, Germany, pp. 1–11. doi:10.15142/T3859Z

10. Bolaños, R., Tornfeldt Sørensen, J., **Beg, M.N.A.**, Svenstrup Petersen, O., Rugbjer, M., Jensen, H. R., 2013. Oceanographic downscaling with unstructured modelling: Towards oceanwave-atmosphere coupling, The Future of Operational Oceanography 2013 - Ideas, Methods & Products (FUTOORE). 8-10 October 2013, Hamburg, Germany.

11. Hasan, M.M., Khan, Z.H, Azadi, M.A and **Beg, M.N.A.** 2012. Restoration of Spawning Ground and Assessment of Salinity Intrusion in Halda River, International Conference on Water Resources. 5-9 November 2012, Langkawi Kedah, Malaysia

Conference presentations and posters:

1. Meselhe, E., **Beg, M.N.A.**, Halgren, J., Kim, DongHa, Ogden, F., Flowers, T., 2020. Heterogeneous Channel Routing Strategy for the National Water Model. AGU Fall Meeting 2020, USA, 1-17 December 2020.

2. White, Eric D., **Beg, M.N.A.**, Meselhe, E., 2020. Optimizing hydraulic routing at the continental scale: identifying where and when dynamic wave routing is required. AGU Fall Meeting 2020, USA, 1-17 December 2020.

3. Meselhe, E., White, Eric D., **Beg, M.N.A.**, Halgren, J., Kim, DongHa, Ogden, F., and Flowers, T., 2020. Continental Scale Heterogeneous Channel Routing Strategy for Operational Forecast Models, Unified Forecast System Users' Workshop, USA, 20 August, 2020

4. Carvalho, R.F., **Beg, M.N.A.**, Lopes, P., 2019. Characterisation of jet impingements on a pool falling from different heights (Poster), 3rd Iberian FOAM Meeting, Porto, Portugal, 11-12 June 2019

5. Beg, M.N.A., Carvalho, R.F., Leandro, J., 2018. Suspended Sediment Transport model in Urban Drainage structure, 2nd Iberian FOAM Meeting, Santiago de Compostela, Spain, 28-29 May 2018

6. Beg, M.N.A., Carvalho, R.F., Leandro, J., 2017. Numerical and experimental flow investigation in a surcharged manhole (Poster), QUICS Final Dissemination Event, Amsterdam International Water Week, 2 November 2017, Amsterdam, The Netherlands

7. Beg, M.N.A., Carvalho, R.F., Leandro, J., 2017. Comparison of Gully Flow Due to Different Gully Outlets, 12th OpenFOAM Workshop. 24-27 July 2017, University of Exeter, Exeter, UK

8. Beg, M.N.A., Carvalho, R.F., Leandro, J., 2017. Effect of surcharge on gully and manhole flow, 2º FOAM @ PT / 1º FOAM IBÉRICO, 2 July 2017, University of Coimbra, Coimbra, UK

9. Beg, M.N.A., Carvalho, R.F., Leandro, J., 2017. Flow investigation in a Gully-Manhole drainage system (Poster), QUICS Dissemination Event, Aquafin. 15 June 2016, Antwerp, Belgium

EXPERIENCE

September 2019-Present:

Postdoctoral Fellow, Tulane River and Coastal Center, Department of River-Coastal Science and Engineering, New Orleans, Louisiana, USA

July 2019-August 2019 – 2 months:

Postdoctoral researcher, Department of Polymer Engineering, University of Minho, Campus of Azurém, Guimarães, Portugal

May 2018-June 2019 – 1 year and 2 months:

Researcher, Hydraulic Laboratory, Water Resources and Environment, Department of Civil Engineering, University of Coimbra, Portugal

May 2015-April 2018 – 3 years:

Early Stage Researcher, Marie Curie actions ITN, Hydraulic Laboratory, Water Resources and Environment, Department of Civil Engineering, University of Coimbra, Portugal

November 2017-January 2018 – 3 months:

Visiting Researcher (Secondment as a Marie Curie fellow), Chair of Hydrology and River Basin Management, Department of Civil Geo and Environmental Engineering, Technical University of Munich, Munich, DE

September-October 2017– 1 month:

Visiting Researcher (secondment as a Marie Curie fellow), CFD Research Group, Faculty of Mechanical Engineering and Naval Architecture (FSB), University of Zagreb, Zagreb, Croatia

April-July 2016 and April 2017 – 5 months:

Visiting Researcher (secondment as a Marie Curie fellow), Department of Civil and Structural Engineering, University of Sheffield, Sheffield, UK

March-September 2013 – 6 months:

Intern Engineer, Port, and Offshore technology department, DHI Water and Environment, Agern Alle 5, 2970 Hørsholm, Denmark

Oct 2013 to Mar 2015 and Oct 2009 to Aug 2011 – 3 years and 6 months:

Junior Specialist/Hydraulic Engineer, Coast Port and Estuary management division, Institute of Water Modelling (http://www.iwmbd.org/), Mohakhali, Dhaka, Bangladesh

SCHOLARSHIPS/FELLOWSHIPS/GRANTS

1. Awarded Postdoctoral Fellowship Grant, provided by FCT - Foundation for Science and Technology, Govt. of Portugal; under the reference 'IPC/SmartPool/MCN/04/2019' from July to September 2019

2. Awarded travel, accommodation, and participation grant to attend *TUM 10th Research Opportunities Week*, organized by 'TUM ForTe - Research Funding & Technology Transfer' held at Munich, Germany, on 1-5 May 2019

3. Marie Skłodowska-Curie actions - Research Grant, provided by the European Union, for

three years, from May 2015 to April 2018

4. Awarded travel, accommodation and participation grant for HYDRALAB+ Next Generation Researchers Workshop, held at Toulouse, France, 18-20 January 2017

5. International Post Graduate Research Scholarship (IPRS), provided by the Department of Innovation Science and Research, Australian Government for three years from 2014 to 2017 (Self-withdrawal)

6. Erasmus Mundus Category A Scholarship, provided by the European Union, for two years from September 2011 to August 2013.

7. Technical Scholarship, provided by Bangladesh University of Engineering and Technology for four years, from 2004 to 2008

INVITED TALKS

1. Investigation of water quantity and quality in urban drainage structures using experimental measurements and CFD, Environmental Informatics, Brandenburg Technical University Cottbus-Senftenberg, Germany; 25 January 2018

2. Suspended Sediment Transport model in Urban Drainage structure, QUICS Final Dissemination Event, Amsterdam International Water Week, Amsterdam, The Netherlands; 2 November 2017

3. Application of CFD modelling in Water Resources Engineering, Institute of Water Modelling, Dhaka, Bangladesh; 8 January 2017

4. Application of CFD modelling in Water Resources Engineering, Department of Water Resources, Bangladesh University of Engineering and Technology, Dhaka, Bangladesh; 9 January 2017

5. Numerical Investigation of the Flow Field inside a Manhole, Pennine water group, Department of Civil and Structural Engineering, University of Sheffield, UK; 1 June 2016

TRAINING RECEIVED

- Attended a two days long training event named "QUICS Training Event on Application, Planning and Grant Writing", Organized by University of Coimbra, Portugal on 10 to 12 May 2017
- Attended a day-long workshop named "CFD: From Theory to Practice", organized by Imperial College of London at London, the UK on 30 March 2017
- Attended a three days long training named "HYDRALAB+ Next Generation Researchers' Workshop", focused on *Scaling issues in hydraulic models and optical measurement techniques*, organized by Hydralab project in Toulouse, France on 18-20 January 2017
- Attended a three days long training event named "QUICS Training Event on Modelling Techniques and Uncertainty Analysis Frameworks", Organized by Technical University of Delft, at Delft, the Netherlands on 25 to 27 January 2016
- Attended a four days long training event named "QUICS Training Event on Water Quality Modelling and Uncertainty Assessment", Organized by University of Sheffield, at Sheffield, the UK on 19 to 22 October 2015
- A daylong training session on OpenFOAM modeling during "1st FOAM@PT" workshop, organized by Universidade do Minho at Guimarães, Portugal on 10 July 2015
- Attended a three days long summer school on "Measuring techniques for turbulent open-

channel flows", Organized by Instituto Superior Técnico Lisbon at Lisbon, Portugal on 28 to 30 July 2015

- Attended a four days long training event naming "QUICS Training Event on Remote Sensing, Data Collection and Data Validation", Organized by Luxembourg Institute of Science and Technology, at Lultzhausen, Haute Sûre, Luxembourg on 15 to 18 June 2015
- Attended a two days long training event naming "QUICS Training Event on Scaling Issues in Hydrology within a Flood Resilience Context", Organized by Justus Liebig University Giessen, Germany on 25-26 November 2014
- Attended a one-week long training on “Wave Modelling”, Organized by Institute of Water Modelling (IWM) held at IWM during June 2014
- Attended a one-week long training on “Storm Surge Modelling using MIKE21”, Organized by Institute of Water Modelling (IWM) held at IWM during November 2013
- “ERASMUS Intensive Program: Training on European Integrated Flood Management (EURO-IFM)” Organized by University of Nice Sophia Antipolis, France held at Nice, France during 1 December 2012 to 23 February 2013 (120h)
- Attended on a one-month long training on “Orientation Course for the Newly Recruited Junior Engineers (JE) – 2009” Organized by Institute of Water Modelling (IWM) held at IWM during November-December 2009 which covered basic training about model simulation on MIKE 11, MIKE 21, MIKE 21FM.
- Attended in one-week long Training on “Training on Environmental Application of Remote Sensing”, Organized by Institute of Water Modelling (IWM) held at IWM during May 2010
- Attended a three-months-long training “Training on Practical Field Surveying and Data Analysis” Organized by Institute of Water Modelling (IWM) held at IWM during January-March 2010
- In-house training on MIKE3, MIKE21, MIKE21 FM, MIKE11, Delft 3D, Hydro-pro at the job place

SUPERVISION

1. MSc thesis: He Jiaying (January-December 2019), Hydrology and River Basin Management, Technical University of Munich, Germany

2. MSc thesis: Kasih Ditaningtyas Sari (January-July 2018), Hydrology and River Basin Management, Technical University of Munich, Germany

3. BSc thesis: Armin Gander (March-August 2018), Hydrology and River Basin Management, Technical University of Munich, Germany

TECHNICAL SKILLS

- CFD Package: OpenFOAM, Flow3D
- Hydrodynamic modeling packages for river, coast and ocean: MIKE3FM, MIKE21FM, MIKE21, MIKE11, Delft 3D, HEC-RAS, HEC HMS, SWMM, MODFLOW, ISIS 1D, StormCAD
- Programming Language: Matlab, Fortran, C++, R, Visual C++
- Office tools: Word, Excel, Access, PowerPoint & Photoshop
- GIS & Remote sensing: ArcGIS 10.1, ArcGIS 9.3, ArcVIEW 3.2
- Data analysis: ParaView, Hydro-pro, Surfer

- Survey Software: Hyro-pro, Terra Model
- Drawing tools: AutoCAD (2D), SALOME

CAMPUS OR DEPARTMENTAL TALKS

- An introduction to programming in MATLAB, Lecture presented at the Programming Club of University of Coimbra on 24 October 2018
- Application of CFD modelling in Water Resources Engineering, Lecture presented at Environmental Engineering MSc course at the Department of Civil Engineering, the University of Coimbra on 22 February 2017

OTHER PROFESSIONAL ACTIVITIES

- Was part of organizing the team for the workshop named "2º FOAM @ PT / 1º FOAM IBÉRICO" at University of Coimbra, 1-2 June 2017
- Convened an advanced training course at "2º FOAM @ PT / 1º FOAM IBÉRICO", named "Advanced meshing using cfMesh" on 1 June 2017
- Attended AGU2019 Conference in San Francisco, during 7-11 December 2019

REVIEWING ACTIVITIES AND JUDGES

- Reviewing editor, Frontiers in Earth Science (a journal from Frontiers)
- Reviewing editor, Urban Water Journal (a journal from Taylor & Francis)
- Reviewing editor, Water (a journal from MDPI)
- Reviewing editor, Sensors (a journal from MDPI)
- OSPA judge, AGU2019
- OSPA judge, AGU2020

OUTREACH ACTIVITIES

1. Conducting a workshop to educate the effect of water pollution and oil spill problem in the ocean to some high school students at Delft, Netherlands, on January 2016
2. Conducting a workshop to familiarize water pollution and purification to some primary school students at Sheffield, UK, on October 2015
3. Conducting a workshop to familiarize the effect of water pollution and climate change to some high school students at Lultzhausen, Luxemburg, on June 2015

MEMBERSHIP & AFFILIATIONS

1. Affiliated Member, American Society of Civil Engineers (Member ID: 000011926815)
2. Member, American Geophysical Union (Member ID: 1157054)
3. Member, International Association for Hydro-Environment Engineering and Research (IAHR, member ID: 47197)
4. Member, Marine and Environmental Sciences Centre (MARE), Portugal
5. Member, Institution of Engineers, Bangladesh

RESEARCH PROFILES

1. Google Scholar: https://scholar.google.com/citations?user=737ch_QAAAAJ&hl
2. ResearchGate: https://www.researchgate.net/profile/Md_Nazmul_Azim_Beg

3. ORCID: https://orcid.org/0000-0002-7801-4272
4. Scopus Author ID: 57191342006
5. LinkedIn: https://www.linkedin.com/in/md-nazmul-azim-beg-0b35604

REFERENCES

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