

ROB GOVERS

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Geophysics Branch/Faculty of Geosciences
Utrecht University
P.O. Box 80.021
3508 TA Utrecht
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Education:

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|--------------------|------------|-------|------|-----------------------------|
| Utrecht University | Geophysics | M.Sc. | 1988 | |
| Utrecht University | Geophysics | Ph.D. | 1993 | (M.J.R. Wortel, N.J. Vlaar) |

Research

Expertise

Geodynamics of plate boundary regions, surface expressions of mantle processes, seismic cycle from Global Positioning System and other geodetic techniques, rheology and large-scale tectonics. Particular regions of interest: active margins of the North American continent, the Caribbean region, the Mediterranean-Paratethys region. Develop and use finite element and finite difference software for the solution of partial differential equations, and for visualization of the numerical solutions.

Appointments:

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| 2009- | Associate Professor of Geophysics, Faculty of Geosciences, Utrecht University, Netherlands |
| 1995-2009 | Assistant Professor of Geophysics, Faculty of Geosciences, Utrecht University, Netherlands [tenure granted 1996] |
| 1993-1995 | Postdoctoral researcher, Department of Geosciences, The Pennsylvania State University, University Park, PA |
| 1993 | Postdoctoral researcher, Utrecht University, Netherlands |

Memberships:

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| 1989- | American Geophysical Union |
| 1995- | Geological Society of America |

Publications (peer reviewed, H-index=15)

1. Wortel, M.J.R., Remkes, M.J.N., **Govers, R.**, Cloetingh, S.A.P.L. and Meijer, P.T., 1991. Dynamics of the lithosphere and the intraplate stress field. *Philosophical Transactions of the Royal Society A*, 337: 111-126.
2. **Govers, R.**, Wortel, M.J.R., Cloetingh, S.A.P.L. and Stein, C.A., 1992. Stress magnitude estimates from earthquakes in oceanic plate interiors. *Journal Geophysical Research*, 97: 11,749-11,759.
3. **Govers, R.** and Wortel, M.J.R., 1993. Initiation of asymmetric extension in continental lithosphere. *Tectonophysics*, 223: 75-96.
4. **Govers, R.M.A.**, 1993. Dynamics of lithospheric extension: A modeling study. *Geologica Ultraiectina*, 105, 240 pp.
5. **Govers, R.** and Wortel, M.J.R., 1995. Extension of stable continental lithosphere and the initiation of lithosphere scale faults. *Tectonics*, 14(4): 1041-1055.
6. Goes, S., **Govers, R.**, Schwartz, S. and Furlong, K., 1997. Three-dimensional thermal modeling for the Mendocino Triple Junction area. *Earth and Planetary Science Letters*, 148: 45-57.
7. Meijer, P.T., **Govers, R.** and Wortel, M.J.R., 1997. Forces controlling the present-day state of

- stress in the Andes. *Earth and Planetary Science Letters*, 148: 157-170.
8. Prims, J., Furlong, K.P., Rohr, K.M.M. and **Govers, R.**, 1997. Lithospheric structure along the Queen Charlotte margin in western Canada: constraints from flexural modeling. *Geo-Marine Letters*, 17: 94-99.
 9. Buitert, S.J.H., Wortel, M.J.R. and **Govers, R.**, 1998. The role of subduction in the evolution of the Apennines foreland basin. *Tectonophysics*, 296: 249-268.
 10. Kreemer, C., **Govers, R.**, Furlong, K.P. and Holt, W.E., 1998. Plate boundary deformation between the Pacific and North America in the Explorer region. *Tectonophysics*, 293: 225-238.
 11. Furlong, K.P. and **Govers, R.**, 1999. Ephemeral crustal thickening at a triple junction: the Mendocino crustal conveyor. *Geology*, 27: 127-130.
 12. **Govers, R.** and Wortel, M.J.R., 1999. Some remarks on the relation between vertical motions of the lithosphere during extension and the "necking depth" parameter inferred from kinematic modeling studies. *Journal Geophysical Research*, 104: 23,245-23,254.
 13. Goes, S., **Govers, R.** and Vacher, P., 2000. Shallow mantle temperatures under Europe from P and S wave tomography. *Journal Geophysical Research*, 105: 11,153-11,169.
 14. Goes, S., Loohuis, J.P., Wortel, M.J.R. and **Govers, R.**, 2000. The effect of plate stresses and shallow mantle temperatures on tectonics of northwestern Europe. *Global and Planetary Change*, 27: 23-28.
 15. Kreemer, C., Holt, W.E., Goes, S. and **Govers, R.**, 2000. Active deformation in Eastern Indonesia and the Philippines from GPS and seismicity data. *Journal Geophysical Research*, 105: 663-680.
 16. Buitert, S., **Govers, R.** and Wortel, R., 2001. A modelling study of vertical surface displacements at convergent plate margins. *Geophys. J. Int.*, 147: 415-427.
 17. **Govers, R.** and Meijer, P.T., 2001. On the dynamics of the Juan de Fuca plate. *Earth and Planetary Science Letters*, 189: 115-131.
 18. van Wijk, J.W., **Govers, R.** and Furlong, K.P., 2001. 3-D thermal modeling of the southern California upper mantle; the tectonic history of microplates. *Earth and Planetary Science Letters*, 186: 175-186.
 19. Buitert, S., **Govers, R.** and Wortel, R., 2002. Two-dimensional simulations of surface deformation caused by slab detachment. *Tectonophysics*, 354(3-4): 195-210.
 20. Fernandes, R.M.S., B.A.C. Ambrosius, R. Noomen, L. Bastos, M. J. R. Wortel, W. Spakman, and **R. Govers**, 2003. The relative motion between Africa and Eurasia as derived from ITRF2000 and GPS data. *Geophysical Research Letters*, 30(16): 1828-.
 21. **Govers, R.** and Wortel, M.J.R., 2005. Lithosphere tearing at STEP faults: dynamic consequences of slab edges. *Earth and Planetary Science Letters*, 236/1-2: 505-523.
 22. Schmalzle, G., Dixon, T., Malservisi, R. and **Govers, R.**, 2006. Strain Accumulation across the Carrizo Segment of the San Andreas Fault, California: Impact of Laterally Varying Crustal Properties. *Journal of Geophysical Research*, 111(B05403).
 23. De Franco, R., **Govers, R.** and Wortel, R., 2007. Numerical comparison of different convergent plate contacts: subduction channel and subduction fault, *Geophysical Journal International*, doi: 10.1111/j.1365-246X.2006.03498.x.
 24. De Franco, R., **Govers, R.**, and R. Wortel, Dynamics of continental collision: influence of the plate contact, *Geophysical Journal International*, doi: 10.1111/j.1365-246X.2008.03857.x, 2008.
 25. De Franco, R., **Govers, R.**, and R. Wortel, Nature of the plate contact and subduction zone diversity, *Earth and Planetary Science Letters*, 271 (1-4), 245-253, doi: 10.1016/j.epsl.2008.04.019, 2008.
 26. Riva, R., and **Govers, R.**, Relating viscosities from post-seismic relaxation to a realistic viscosity structure for the lithosphere, *Geophysical Journal International*, 10.1111/j.1365-246X.2008.04004.x, 2008.
 27. Wortel, R., **R. Govers**, and W. Spakman, Continental collision and the STEP-wise evolution of convergent plate boundaries: from structure to dynamics, *in*: S. Lallemand and F. Funiciello (Eds.), *Subduction Zone Geodynamics*, pp. 47-59, doi: 10.1007/978-3-540-87974-9, 2009.
 28. Van Hinsbergen, D.J.J., Edwards, M.A., and **Govers, R.** (Eds.), *Collision and Collapse at the Africa – Arabia – Eurasia Subduction Zone*. Geological Society, London, Special Publications, 311, 2009.

29. Van Hinsbergen, D.J.J., Edwards, M.A., and **Govers, R.**, Geodynamics of collision and collapse at the Africa-Arabia-Eurasia subduction zone - an introduction, in: Van Hinsbergen, D.J.J., Edwards, M.A., and Govers, R. (Eds.), *Collision and Collapse at the Africa – Arabia – Eurasia Subduction Zone*, pp.1-7, Geological Society, London, Special Publications, 311, 2009.
30. **Govers, R.**, P. Th. Meijer, and W. Krijgsman, Regional isostatic response to Messinian Salinity Crisis events, *Tectonophysics*, **463**(1-4), doi: 10.1016/j.tecto.2008.09.026, 2009.
31. **Govers, R.**, Choking the Mediterranean to dehydration: the Messinian Salinity Crisis, *Geology*, **37**(2), 167-170, 2009.
32. LaFemina, P., T. Dixon, **R. Govers**, E. Norabuena, H. Turner, A. Saballos, G. Mattioli, M. Protti, and W. Strauch, Forearc motion and Cocos Ridge collision in Central America, doi:10.1029/2008GC002181, *G³*, 2009.
33. Plattner, C., R. Malservisi, and **R. Govers**, On the plate boundary forces that drive and resist Baja California motion, *Geology*, **37**(4), 359-362, 2009.
34. Bartol, J., and **R. Govers**, Flexure due to the Messinian-Pontian sea level drop in the Black Sea, *G³*, **10**, Q10013, doi:10.1029/2009GC002672, 2009.
35. Plattner, C., R. Malservisi, K.P. Furlong and **R. Govers**, Development of the Eastern California Shear Zone - Walker Lane belt: Effect of pre-existing weakness in the Basin and Range, *Tectonophysics*, **485**(1-4), 78-84, doi: 10.1016/j.tecto.2009.11.021, 2010.
36. van Benthem, S., and **R. Govers**, The Caribbean plate: pulled, pushed or dragged? *Journal of Geophysical Research B*, **115**, B10409, doi:10.1029/2009JB006950, 2010.
37. Warners-Ruckstuhl, K.N., P.Th. Meijer, **R. Govers**, and M.J.R. Wortel, A lithosphere-dynamics constraint on mantle flow: analysis of the Eurasian plate, *Geophys. Res. Lett.*, **37**, L18308, doi:10.1029/2010GL044431, 2010.
38. Baes, M., **R. Govers** and M.J.R. Wortel, Subduction initiation along a STEP fault: Insights from numerical models, *Geophys. J. Int.*, **184**(3), 991-1008, doi: 10.1111/j.1365-246X.2010.04896.x, 2011.
39. Baes, M., **R. Govers** and M.J.R. Wortel, Switching between alternative responses of the lithosphere to continental collision, *Geophys. J. Int.*, in press, 2011.
40. Warners-Ruckstuhl, K.N., **R. Govers**, and M.J.R. Wortel, Lithosphere-mantle coupling and the dynamics of the Eurasian plate, submitted to *Geophys. J. Int.*, August 2, 2011.
41. Warners-Ruckstuhl, K.N., **R. Govers**, and M.J.R. Wortel, Forces controlling the stress field of the Eurasian plate: impact of collision forces, submitted to *Earth and Planetary Science Letters*, 2011.

Other publications

- Govers, R.**, 1995. Numerical modelling: Mixing fluids and solids, *Nature (News and Views)*, pp. 645.
- Wortel, M.J.R. and **Govers, R.**, 2004. Van continental drift tot plaattektoniek. In: E. Berkens, e.a. (Editor), *De Aarde verdeeld en verbeeld, berekend en getekend*. Walburg Pers, Zutphen, The Netherlands, pp. 42-45.
- Stille kracht; De hand onder de Andes, *Natuur-Wetenschap en Techniek (NWT)*, **75**(11), 2007.
- Hoe de Middellandse Zee een zoutpan werd, *Natuur-Wetenschap en Techniek (NWT)*, **76**(12), 2008.
- Van Benthem, S., en **R. Govers**, De tijdbom onder Haïti, *Geografie*, **7-8**, 2010
- Wortel, R., and **R. Govers**, Driving Earth's surface motions, *Nature "News and Views"*, **465**, 559, 2010.

Project acquisitions

- NSF “Implications of grain growth observations for the evolution of the western Mediterranean upper mantle” (\$26,058), 7/1/94 - 6/31/95 (**P.I.**)
- NATO “The dynamic evolution of microplates”, NATO Collaborative Research Grant 1996 (**P.I.**)
- NEESDI "Mantle driven vertical motions in central and southern Europe: implications for tectonic and sedimentary processes in northwestern Europe", postdoctoral position Saskia Goes, 1997.
- UU/GOI “Modes of Collision: Transient Plate Tectonics Along The Tethys”, Ph.D. position De-Franco, 2003-2007 (**P.I.**)
- NWO “Why Western Mediterranean basins evolved diversely since the Oligocene”, Wortel and

- Govers, granted as part of the ESF EUROCORES Collaborative Research Proposal Euro-Margins/WESTMED Ph.D. project Baes 2004 (**co-P.I.**).
- NWO “Geodynamic evolution STEPS in the Western Mediterranean”, Wortel and Govers, granted as part of the ESF EUROCORES Collaborative Research Proposal Euro-Margins/WESTMED: Ph.D. project Ruckstuhl 2004 (**co-P.I.**).
- NWO “How plate tearing and slabs drive reorganization of the N Caribbean plate boundary”, NWO/ALW open competition, Ph.D. project Van Benthem 2006 (**P.I.**).
- ISES “Numerical modeling of strain localization”, Ph.D. project, 2010 (**P.I.**).
- ISES “Coupling deep structure to new neotectonic observations along the Algerian margin”, Visiting Research Fellow grant Domzig, 2007.
- NWO “Quantifying uplift due to evolution of East Mediterranean plate boundaries and upper mantle structure”, Govers and Wortel, granted as part of the ESF EUROCORES Collaborative Research Proposal TopoEurope/VAMP Ph.D. project 2008 (€228,800) (**P.I.**).
- ISES Technician numerical modeling support 2009-2010.
- NWO/SRON “New constraints on lithosphere rheology from the gravitational signature of post-seismic deformation”, Govers and Riva, Postdoc project 2009 (€212,000) (**P.I.**).
- NWO/NCF “Scalability properties of GTECTON”, Govers (20,000 Processor Node Hours) (**P.I.**).
- ISES Technician numerical modeling support 2011-2013.

Invited talk and lectures (2002-2011; conference abstracts on <http://www.geo.uu.nl/~govers>)

- **R. Govers**, In between strike slip and subduction: lithosphere scale transitional tectonics of the Southern Alps, (invited) Western Pacific Geophysics Meeting, Wellington, New Zealand, EOS Trans. AGU, 83(22), 71, 2002.
- **R. Govers**, De motor van de plaattektoniek: krachten op de Juan de Fuca plaat, (invited) GEA, Naturalis, Leiden, November 26, 2002.
- **R. Govers**, STEP faults and their imprint, (invited), RSMAS Seminar, University of Miami, Florida, U.S.A., November 17, 2003.
- **R. Govers**, R. Riva and R. Wortel, STEPs and Central Italy GPS, (invited) Workshop on the thermal aspects of Earthscope, Salt Lake City, Utah, U.S.A., March 19, 2004.
- Goes, S., S. van der Lee, **R. Govers**, and P. Vacher, Seismic constraints on the thermal structure of continental lithosphere (invited EGU04-A-04662), Nice, France, 2004.
- Riva, R., **R. Govers**, and A. Aoudia, Crustal lateral heterogeneities and postseismic relaxation (invited EGU04-A-00484), EGU, Nice, France, 2004.
- **R. Govers**, What is moving Vrancea, or, the Geodynamics of the SE Carpathians (invited), Earth Science Department Seminar, Ludwig Maximilians Universität, Munich, Germany, 2005.
- De Franco, R., and **R. Govers**, Subduction following continent-continental fragment collision: insights from two-dimensional numerical experiments (invited), 06917, EGU, 2005.
- De Franco, R., **R. Govers**, and R. Wortel, The impact of having a subduction channel or a subduction fault, EGU, Vienna, Austria, 2007.
- Plattner, C., Malservisi, and **R. Govers**, Can lithospheric coupling explain transport of the Baja California microplate, IASPEI Cape Town, 2009.
- **R. Govers**, Lithospheric response to, and influence on, the Messinian Salinity Crisis in the Mediterranean and Black Sea region. Earth Sciences Institute colloquium University of Potsdam, 2009.
- **R. Govers**, Aardbevingen, Studium Generale Groningen, april 12, 2010.
- **R. Govers**, De voorspelbaarheid van aardbevingen, KNAG lezing Utrecht, 19 mei, 2010.
- **R. Govers** and Tim Wright, Deformation of the Lithosphere: Observation and Modeling, Videres Elite PhD course, København University, Denmark, 13-17 September 2010.
- **R. Govers**, De voorspelbaarheid van aardbevingen, Lezing Specialistenserie Geologie, Naturalis Den Haag, 22 oktober, 2010.
- **R. Govers**, R. Wortel, and M. Baes, Initiation of the post-Oligocene subduction phase in the Western Mediterranean, AGU Fall Meeting, San Francisco, U.S.A., 13-16 December 2010.

Collaborators & Other Affiliations

Kevin Furlong (Penn State University, U.S.A.)
Tim Dixon (USF, Tampa, U.S.A.)
Eric Calais (Purdue University, U.S.A.)
Uri ten Brink (USGS Woods Hole, U.S.A.)
Giovanni Bertotti (Free University, Amsterdam)
Tini Plattner (U. Miami, U.S.A.)

Andy Hooper (Delft Technical University, NL)
Manel Fernandez (CSIC Barcelona, Spain)
Pete Lafemina (Penn State University, U.S.A.)
Rocco Malservisi (USF, Tampa, U.S.A.)
Manfred Strecker (Univ. Potsdam, Germany)
Jeroen van Hunen (Durham Univ. U.K.)

Completed M.Sc. thesis Advisor

S. Dortland, C. Kreemer, P. Langebroek, J. van Wijk, Y. Berfelo, A. Reynaldos, M. van Eck van der Sluis, J. Bartol, A. Pots

Ph.D. thesis Advisor (“copromotor”)

- Buiter, S.J.H., Surface deformation resulting from subduction and slab detachment, Ph.D. thesis Utrecht University, *Geologica Ultraiectina*, 191, 134 pp., 2000.
- Riva, R.E.M., Crustal rheology and postseismic deformation: modeling and application to the Apennines, Ph.D. thesis, Delft University Press, 117 pp., 2004.
- De Franco, R., Dynamics of subduction and continental collision: influence of the nature of the plate contact, Ph.D. thesis Utrecht University, *Geologica Ultraiectina*, 284, 129 pp., 2008 ([full text](#)).
- Schmalzle, G., The earthquake cycle of strike-slip faults, Ph.D. thesis University of Miami, Miami, FL, U.S.A., Rosenstiel School of Marine and Atmospheric Science, Division of Marine Geology and Geophysics, 193 pp., 2008.
- Baes, M., Reorganization of convergent plate boundaries, *Mededelingen van de Faculteit Geowetenschappen Universiteit Utrecht* (Ph.D. thesis Utrecht University), 340, May 18, 2011 ([full text](#)).

Current Ph.D. thesis Advisor

- Rückstuhl, K.N., Dynamics and stress field of the Eurasian plate: a combined lithosphere-mantle approach; Funded by: NWO/ESF; Contract period: 12/2004-12/2008 (extended to 9/2011 due to parallel career in international athletics); Defense: Utrecht University, February 2012.
- Van Benthem, S., Geodynamics of the North Caribbean Plate Boundary; Funded by: ALW/NWO; Contract period: 4/2007-4/2011; Defense: Utrecht University, 2011.
- Özbakir, A.D., Thermo-mechanical modeling of accretion, collision and extension along the Aegean-Anatolian-Bitlis/Zagros convergent plate boundary, with implications for the Cenozoic-geodynamical evolution of Anatolia; Funded by: ISES; Contract period: 9/2007-9/2011; Defense: Utrecht University, 2011.
- Bartol, J., Numerical models of subduction-related processes and their application to the East Mediterranean, Funded by: NWO/ESF; Contract period: 10/2008-2012; Defense: Utrecht University, 2012.
- Austmann, W., TopoMed/ISES, Contract period 10/2010-9/2014; Defense: Utrecht University, 2014.

Former Postdoctoral Associates

S. Goes (Ph.D. 1995, Santa Cruz, U.S.A.)
P. Vacher (Ph.D. 1995, Nantes, France)
A. Domzig (Ph.D. 2006, Brest, France)
C. Tirel (Ph.D. 2004, Rennes, France)
S. Quéré (Ph.D. 1999, Toulouse, France)
R. Riva (Ph.D. 2004, Delft, Netherlands)

Research award

Senior Kwalificatie Onderzoek, awarded by Utrecht University, 2008.

Teaching

Teaching awards

Basis Kwalificatie Onderwijs, awarded by Utrecht University, 2006.

Senior Kwalificatie Onderwijs, awarded by Utrecht University, 2007.

| Course | Developed by | Tought by | Group |
|---|-------------------------------------|---------------------------------------|--|
| Introduction to Rheology | Govers and others | Govers 1995-2000 | 3 rd year Geology majors and Geophysics majors |
| Introduction to Geophysics | Govers and others | Govers 1995-2000 | 1 st year Earth Science majors |
| Geophysics Lab | Govers | Govers 1996-2000 | 1 st year Earth Science majors |
| System Earth (University College) | Govers and Van der Zwaan | Govers and Van der Zwaan 1999-2000 | 3 ^e jaars liberal arts students |
| System Earth - geophysics part | Govers | Govers 2001 | 1 st year Earth Science majors |
| Oriënterende Projecten | Govers and Middelkoop | Govers and Middelkoop 2001-2003 | 1 st year Earth Science majors |
| Dynamics of the solid Earth | Govers | Govers 2001- | 1 st year Earth Science majors |
| Geophysics-Tectonophysics | Govers and Wortel | Govers and Wortel 2001-2003 | 3 rd year Earth Science majors |
| Geodynamics | Govers, Wortel and Van den Berg | Govers, Wortel and Van den Berg 2005- | 3 rd year Earth Science majors |
| Tectonophysics MSc course | Govers and Wortel | Govers and Wortel 2003-2008 | 1 st year MSc students Earth Sciences |
| Tectonophysical Modeling | Govers and others | Govers 1995- | 2 nd year MSc students Earth Sciences |
| Lithosphere Applications of the Finite Element Method | Govers | Govers 2006- | MSc honors students, PhD students, post-docs, colleagues |
| Fysica | Govers and Van der Vegt | Govers and Van der Vegt, 2009- | 1 st year Earth Science majors |
| Scientific Writing | Mason and Govers | Mason and Govers 2009 | PhD students |
| Introduction to Natural Hazards: Social, Economic and Earth Aspects | Govers, de Jong, Sanders, Meeuwesen | Furlong, de Jong, Sanders, Meeuwesen | 2 nd and 3 rd year bachelor students |

Community service

- One or two convenerships yearly of symposia at international conferences (EGU/AGU). For example, at the 2011 EGU conference in Vienna; lead convener of the Interdivision Session “The Alpine-Himalayan convergence zone: from the Mediterranean to SE Asia” (co-organized by TS, GD & G)
- Editor of “Geodynamics of Collision and Collapse at the Africa-Arabia-Eurasia Subduction Zone”, which will be published as a Geological Society London Special Publication, 2009.
- Co-organizer of the DRT (Deformation mechanisms, Rheology and Tectonics) 2007 Workshop in Oropa, Italy. This workshop is the 16th in a bi-annual series that aims to promote interaction and discussion between modelers, experimentalists and field geologists.
- Member of the Scientific Committee of DRT 2007 Conference in Milan, Italy. Since its initiation in 1976, the conference on Deformation mechanisms, Rheology and Tectonics is a well-established platform for scientific communication between ~200 researchers working on all scales

of field, experimental and theoretical studies
(<http://users.unimi.it/DRT2007/DRT2007.Programme.html>).

- Co-organizer of National Earth Sciences conference (NAC V, 2000), and of conferences of the VMSG research school.
- Reviewer of research proposals and scientific papers.
- Multiple memberships and chair (2005) of NWO/ALW evaluation committees “Open competition”.
- Member of NWO evaluation committee “VENI proposals” (2007-2010).
- Member of the 2007 SmartMix committee of the Netherlands Research Centre for Integrated Solid Earth Science (ISES).
- Member of the education committee of the Faculty of Earth Sciences (UU) 2000-2002.
- Chairman of the bachelor education committee of the Departments of Earth Sciences and Physical Geography (UU) 2003-2008. This committee advises the education managers on all issues related to the bachelor education program. In addition, the committee approves the *Opleidings- en Examenreglement* (OER) and keeps an eye on the quality of bachelor courses using the student and teacher evaluations as input.